

GOVERNMENT OF INDIA
MINISTRY OF COMMERCE



REPORT OF THE
INDIAN TARIFF BOARD
ON THE
PLASTICS INDUSTRY

BOMBAY

1949

PUBLISHED BY THE MANAGER OF PUBLICATIONS DELHI
PRINTED IN INDIA BY THE MANAGER GOVERNMENT OF INDIA PRESS SIMLA 1949

Price : Re. 1/6/- or 2sk.

GOVERNMENT OF INDIA
MINISTRY OF COMMERCE



REPORT OF THE
INDIAN TARIFF BOARD
ON THE
PLASTICS INDUSTRY

सत्यमेव जयते

BOMBAY

1949

PUBLISHED BY THE MANAGER OF PUBLICATIONS DELHI
PRINTED IN INDIA BY THE MANAGER GOVERNMENT OF INDIA PRESS SIMLA 1949

Price : Rs. 1|6|- or 2sh.

List of Agents in India from whom Government of India Publications are available

AGRA—

1. National Book House, Jeomandi.
2. The English Book Depot, Taj Road.
3. Wadhwa & Co., Raja Mandi.

AHMEDABAD—

1. Chandra Kant Chhiman Lal Vohra.
2. New Order Book Co.

AJMER—Banthiya & Co., Ltd., Station Road.

AKOLA—Bakshi, Mr. M. G.

ALLAHABAD—

1. Central Book Depot, 44, Johnstonganj.
2. Kitabistan, 17-A, City Road.
3. Ram Narain Lal, 1, Bank Road.
4. Law Book Company, Post Box No. 4, Albert Rd.
5. Wheeler & Co., M/S. A.H.
6. Superintendent Printing & Stationery, U. P.
7. University Book Agency (of Lahore), P.B. No. 63.

AMBALA CANTT—

1. English Book Depot.
2. Rama Krishna & Sons, Railway Road.

AMRITSAR—

1. The People's Book Shop, Court Road.
2. Sikh Publishing House Ltd., Court Road.

BANARAS—

1. Students Friends, Booksellers, University Gate.
2. Hindi Pustak Agency. (For Hindi publications only.)

BANGALORE—

1. Book Emporium, Messrs. S.S., 118, Q. H. Extension, Parasavangudi P.O.
2. Vichara Shitya Ltd., Balepet.

BAREILLY—Sahitya Niketan, Booksellers etc., Pul Kazi.

BARODA—Good Companions, Booksellers & Stationers.

BIKANER—Goyal & Co.

BOMBAY—

1. Co-operator's Book Depot, 9, Bakehouse.
2. Lakhani Book Depot, Bombay 4.
3. New Book Co., Kitab Mahal, 188-90, Hornby Road.
4. Popular Book Depot, Grant Road.
5. Taraporavala Sons & Co., M/S. D. S.
6. Thacker & Co., Ltd.
7. Tripathi & Co., M/S. N. M., Princess St.
8. Wheeler & Co., M/S. A.H.
9. M/S. National Information & Publications Ltd., National House.
10. The Sydanham College Co-operative Stores Ltd., 90 Hornby Road, Port.
11. Butt & Company, P.O. Box 6014, Parel, Bombay 12.
12. Supdt. Govt. Printing & Stationery, Queens Road

CLIFTON & Co., Post Box 6753, SION.

CHATTURAJ—

1. Chatterjee & Co. 3, Bacharam Chatterjee Lane.
2. Hindu Library, 69-A, Balaram Da Street.
3. Lahiri & Co., Ltd., M/S. S. K.
4. Newman & Co., Ltd., M/S. W.
5. Roy Chowdhury & Co., M/S. N.M., 72, Harrison Road.
6. Sarkar & Sons Ltd., M/S. S. G., 1/1-1-C, College Square.
7. Thacker Spink & Co., (1938) Ltd.
8. Standard Law Book Society 41, Baitale Road, Bhowanipore P.O.
9. R. Cambray & Co. Ltd., Kant House, P 88, Mission Row Extension.
10. Hindi Pustak Agency, 203 Harrison Rd. (For Hindi Pubs. only.)

CUTTACK—Press Officer, Orissa Secretariat.

DEHRADUN—Jugal Kishore & Co., Rajput Road.

DELHI—

1. Federal Law Depot, Kashmere Gate.
2. Technical & Commercial Book Co., Students Park, Kashmere Gate.
3. Atma Ram & Sons, Publishers etc.
4. Jaina & Bros. M/S. J. M., Mori Gate.
5. M. Gulab Singh & Sons, 1, Darya Ganj.
6. Imperial Publishing Co. 3 Falz Bezar, Darya Ganj
7. N. C. Kansil & Co., Model Basti, Lane No. 3.
8. Youngman & Co., (Regd.) Egerton Road.
9. New Stationery House Booksellers etc. Subzi Mandi
10. Metropolitan Book Co.
11. Hindi Pustak Agency. (For Hindi Publications only.)
12. Bahri Brothers, Booksellers.

FEROZEPUR CANTT.—English Book Depot.

GWALIOR—

1. Jain & Brothers, M/S. M.B., Sarafa Road.
2. Mr. P. T. Sathe, Law Books Dealer.

HYDERABAD DECCAN—Hyderabad Book Depot.

INDORE—Students and Studies, Booksellers, Sanyasika Ganj.

JAIPUR CITY—Garg Book Company, Tripola Bazar.

JAMMU (TAWI)—Krishna General Stores, Bookseller etc., Raghunath Bazar.

JHANSI—Bhatia Book Depot, Sadar Bazar.

JODHPUR—

1. Kitab Ghar, Sajoti Gate.
2. Mr. Dwarkadas Rathil, Bookseller.

KANPUR—

1. Advani & Co., The Mall.
2. Universal Book Stall, The Mall.
3. Sahitya Niketan, Booksellers etc.

KOLHAPUR—Maharashtra Granth Bhandar.

LUDHIANA—

1. Mr. Dharam Parkash, B.Sc., Bookseller etc., Benjamin Road.
2. Lyall Book Depot, Booksellers.

LUCKNOW—

1. J. Ray and Sons (India) Ltd.
2. Law Book Agency Publishers etc. 20-A, Kachery Road.
3. Universal Publishers, Ltd., Plaza Building, Hazrat Ganj.
4. Upper India Publishing House Ltd., Literature Place, Aminuddaula Park.
5. New Oxford Book Co., Jahangirabad Palace.

MADRAS—

1. Higginbotham.
2. Vaidachary & Co., M/S. P.
3. Supdt. Government Press, Mount Road.

MERUT CANTT.—Mr. Dharam Parkash, B.Sc., Booksellers etc.

NAGPUR—Supdt. Govt. Printing, Central Provinces.

NEW DELHI—

1. Anur Book Co., Connaught Circus.
2. Bhawanani & Sons, Connaught Place.
3. Jaina Book Agency, Connaught Place.
4. R. S. Bawa Harkishan Das Bedi, Importers etc.
5. Saraswati Book Depot, 15, Lady Harding Road.
6. Faqr Chand Marwah & Sons, No. 1-A, Regal Building, Connaught Circus.
7. Rama Krishna & Sons (of Lahore) 13/13 Connaught Place.
8. Oxford Book & Stationery Coy., Scindia House.
9. J. Ray & Sons (India) Ltd.
10. Empire Book Depot.
11. Sikh Publishing House Ltd. 76, Connaught Place.
12. Clifton & Co., Original Road.

PATNA—Supdt. Govt. Printing Bihar, P.O. Gulzarbagh.

PATNA CITY—

1. Lakshmi Trading Co., Padri Ki Havell.
2. Raghunath Parshad & Sons.
3. Hindi Pustak Agency (for Hindi Publications only)

PATIALA—Jainco, Booksellers etc., Bazar Shah Nashin.

1. Derman Bookstall, Fergusson College Road.
2. International Book Service, Deccan Gymkhana.

RAJKOT—Mohanlal Dossabhai Shah.

ROORKEE—The Cambridge Book Depot.

SHILLONG—Supdt. Assam Secretariat Press.

SIMLA—

1. Sunder Das & Sons, Booksellers, 141, Lower Bazar.
2. J. Ray & Sons (India) Ltd.
3. Minerva Book Shop, Regal Cinema Building.

TRICHINOPOLY FORT—Krishnaswami & Co., Messrs. S., Teppakulam.

TRIVANDRUM—International Book House, Bookseller etc., Balla Cualle.

VELLORE—Venkatasubban, Mr. A., Law Bookseller.

PERSONNEL OF THE BOARD

MR. G. L. MEHTA—PRESIDENT.

DR. H. L. DEY, D.Sc. (LONDON)—MEMBER.

DR. B. V. NARAYANASWAMY NAIDU, M.A., PH.D., B. COM.,
BAR-AT-LAW—MEMBER.

MR. M. E. RAHMAN—MEMBER.

MR. B. N. ADARKAR—MEMBER.

MR. R. DORAISWAMY—SECRETARY.

PERSONNEL OF THE PANEL WHICH HEARD THE CASE

MR. G. L. MEHTA—PRESIDENT.

DR. B. V. NARAYANASWAMY NAIDU, M.A., PH.D., B. COM.,
BAR-AT-LAW—MEMBER.



CONTENTS.

PARA	PAGE
SECTION I—GENERAL	
1 Reference to the Board	1
2 Scope of the inquiry	2
3 Method of inquiry	2
4 Importance of the plastics industry in the national economy	3
5 Present position of the plastics industry in India	4
SECTION II—MOULDING POWDER	
6 Raw materials	5
7 Process of manufacture	5
8 Domestic demand for moulding powder	6
9 Domestic production of moulding powder	6
10 Quality of the indigenous phenol-formaldehyde moulding powder.. ..	7
11 Imports of moulding powder	8
12 Existing rate of customs duty	8
13 C. i. f. prices and landed costs	9
14 Board's estimate of cost of production and fair selling price of indigenous phenol-formaldehyde moulding powder	9
15 Protection or assistance to the moulding powder industry	11
SECTION III—PLASTIC GOODS	
16 Raw materials	14
17 Process of manufacture	15
18 Domestic demand	15
19 Domestic production	16
20 Quality of indigenous plasticware	17
21 Imports	17
22 Existing rates of duty	18
23 C. i. f. prices and landed costs	20
24 Method of costing	21
25 Board's estimate of costs of production and fair selling prices of plasticware other than spectacle frames	22
26 Cost of production of spectacle frames	24

(iii)

Para	Page
SECTION III—PLASTIC GOODS—<i>contd.</i>	
27 Claim for protection or assistance to the indigenous plasticware industry ..	24
28 Comparison between c. i. f. prices and fair selling prices	25
29 Protection or assistance recommended :	
(a) General purpose and utility articles : soap boxes, combs, knitting needles	27
(b) Electrical accessories	27
(c) Spectacle frames	28
(d) Import control	29
30 Eligibility for protection	29
31 Subsidiary recommendations :	
(a) Central moulding powder factory	31
(b) Central mould-making shop	31
(c) Programme of priority in the production of plasticware	32
(d) Research in plastics	32
(e) Technical personnel	32
(f) Necessity for prescribing standard specifications	33
(g) Classification of plastic articles in the Customs Tariff and maintenance of adequate statistics of imports of such articles	33
SECTION IV—SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS	
32 Summary of conclusions and recommendations	35
33 Acknowledgments	41
 APPENDICES 	
I. List of persons, firms, associations and others to whom questionnaires were issued and from whom memoranda or replies were received [vide paragraph 3(a)]	43
II. Statement showing the dates of visit to factories by the President, Members, Secretary and other officers [vide paragraph 3(b)]	47
III. List of persons who attended the public inquiry on 14th and 15th June 1949 and who were examined by the Board [vide paragraph 3(c)]	48
IV. Statement showing the rated capacity and actual production of plasticware by firms which replied to the Board's questionnaire [vide paragraph 19] ..	50

REPORT ON THE PLASTICS INDUSTRY

SECTION I—GENERAL.

1. **Reference to the Board.**—(a) The original application for protection or assistance to the plastics industry was made to the Government of India in the Ministry of Commerce by the Kiron Products, Bengal, on 13th July, 1947. On 29th November, 1947, the All-India Plastics Manufacturers' Association submitted a representation in which it drew the attention of Government to the fact that the industry, having developed largely during the war, had to face serious competition from imported plastic goods, specially from the United Kingdom and the United States of America. At the same time, the only firm manufacturing moulding powder on a commercial scale and used in the production of plastic goods, namely, the Industrial Plastics Corporation, Bombay, applied for protection or assistance to the moulding powder industry. Accordingly, the Government of India in the Ministry of Commerce remitted to the Tariff Board for inquiry the case of "plastic goods including moulding powder used in the manufacture thereof." in their Resolution No. I-T(4)|48, dated 20th March 1948, read with paragraphs 2 and 7 of the Department of Commerce Resolution No. 213-T(55)|45, dated 3rd November, 1945, and paragraph 4 of the Resolution of the same number dated 16th February 1946.

(b) Subsequent to the reference made in the Resolution No. I-T(4)|48, dated 20th March 1948, the Ministry of Commerce in their letter No. 33-T(1)|47, dated 18th March 1949, requested the Board to include spectacle frames manufactured from imported cellulose acetate and cellulose nitrate within the scope of the inquiry.

(c) Government further directed that, in accordance with the decision of the Inter-Departmental Meeting held on 29th September, 1948, which was convened to consider the question of the abolition or reduction of the import duty on certain industrial raw materials, the question of the abolition of or reduction in the import duty on celluloid, cellulose acetate, and cellulose butyrate, which are used in the manufacture of plastic goods, should also be taken up by the Tariff Board while considering the claim for production of the plastics industry, in pursuance of Ministry of Commerce letter No. 38-T(1)|47, dated 21st October, 1948.

(d) As in the case of other industries started or developed during the war, the Board has been asked to report whether the plastics industry (including moulding powder) satisfies the following conditions:—

"(1) that it is established and conducted on sound business lines ; and

(2) (a) that, having regard to the natural or economic advantages enjoyed by the industry and its actual or probable costs, it is likely within a reasonable time to develop sufficiently to be able to carry on successfully without protection or State assistance ; or

- (b) that it is an industry to which it is desirable in the national interest to grant protection or assistance and that the probable cost of such protection or assistance to the community is not excessive.

“Where a claim to protection or assistance is found to be established, i.e. if condition (1) and condition 2(a) or (b) are satisfied, the Board will recommend:—

- (i) whether, at what rate and in respect of what articles, or class or description of articles, a protective duty should be imposed.
- (ii) what additional or alternative measures should be taken to protect or assist the industry ; and
- (iii) for what period, not exceeding three years, the tariff or other measures recommended should remain in force.

“In making its recommendations, the Board will give due weight to the interests of the consumers in the light of the prevailing conditions, and also consider how its recommendations would affect industries using the articles in respect of which protection might be granted.”

2. Scope of the inquiry.—The inquiry covers the following branches of the plastics industry, namely—

- (a) moulding powders and resins, such as phenol-formaldehyde moulding powder, urea-formaldehyde moulding powder, cellulose acetate, cellulose nitrate, cellulose butyrate, polystyrene, polyvinyl chloride, casein ;
- (b) semi-fabricated plastic materials, such as sheets, tubes, and rods made of methacrylate, cellulose acetate, cellulose nitrate, casein ;
- (c) all kinds of finished articles made of plastic substances.

3. Method of inquiry.—(a) On 6th April, 1949, the Board issued a press communique inviting associations, firms or persons, including producers, importers and consumers interested in this industry or depending upon it for their raw materials, who wished their views to be considered by the Board, to submit their representations in terms of the questionnaires issued by the Board. The Board also invited the various Provincial and State Governments as well as Chambers of Commerce to communicate their views on the question of the grant of protection to the industry. A list of persons, firms, associations and others to whom questionnaires were issued and from whom memoranda or replies were received is given in Appendix I. Steps were also taken by the Board, in co-operation with the Director-General of Commercial Intelligence and Statistics and the various Collectors of Customs, to collect as accurately as possible statistics of imports of moulding powder and finished plasticware as such figures are not separately maintained at present.

(b) In view of the wide range of articles comprised in the term "plastic goods," it was decided, in consultation with the Directorate-General of Industries and Supplies and the All-India Plastics Manufacturers' Association, that the following items should be taken for purposes of costing as representing a cross-section of the industry:—

- (i) *Industrial accessories*.—Wall plugs ; ceiling roses ; switches ; rods or tubes ; beltings and ribbons.
- (ii) *Utility articles*.—Combs ; knitting needles ; soap boxes ; bottle caps ; umbrella handles.

The following eight factories were selected by the Board for cost investigation:—

- (i) The Industrial Plastics Corporation (TIPCO), Bombay.
- (ii) Indian Plastics, Ltd., Bombay.
- (iii) Hindustan Plastics, Ltd., Bombay.
- (iv) Dominion Plastics Industries, Bombay.
- (v) Plastics Products, Ltd., Kanpur.
- (vi) The Government Electric Factory, Bangalore.
- (vii) Plastic Moulders, Ltd., Calcutta.
- (viii) Bright Brothers, Ltd., Bombay.

The accounts of the above-named factories were examined in detail by Mr. S. V. Rajan, Cost Accountant attached to the Board, along with the Board's Technical Adviser, Mr. S.S. Mehta.

(c) A statement showing the dates of visit to the factories by the President, Members, Secretary and other officers of the Board, is given in Appendix II. The public inquiry was held in Bombay on 14th and 15th June, 1949. A list of persons who attended the inquiry and who were examined by the Board will be found in Appendix III.

4. Importance of the plastics industry in the national economy.—The number and variety of articles made of plastic substances indicate that few industries have such a wide range of products with possibilities of their utilisation in diverse ways as the plastics industry. Within two decades, plastic products have become the basic materials for industrial and constructional purposes. The flexibility with which plastic materials can be worked makes them simpler and cheaper than metal, wood, stones, ceramics or glass. Although plastics, particularly on the synthetic side, cannot completely replace natural materials even in textiles, rubber or leather, it can be confidently expected that, with the industrialisation of the country and in view of the various electrification schemes, plastic articles are and will be increasingly required in the manufacture of machine parts, electric gear, automobile and aircraft construction, besides a multitude of domestic requirements. Apart from the wide range of uses, the plastics industry offers possibilities of assisting in the establishment of a fully developed chemical industry in the country. The branches of the chemical industry which may be regarded as basic in the production of plastics are : (1) coal distillation products, including those derived from coke, tar and coal gas ; (2) alkalis and chlorine ;

(3) alcohols and allied products ; (4) calcium carbide and allied products ; (5) cellulose industries. Many of the raw materials used in the manufacture of plastics are in the nature of intermediate chemicals because they constitute a link between the ultimate raw materials and the finished articles. The plastics industry thus offers a wide scope for the utilisation of various products of the chemical industry whose development is vital to national security. We are, therefore, of the opinion that the economic development of the plastic industry is a matter of importance both on its own account and because of its influence on the development and maintenance of basic chemical industries.

5. Present position of the plastics industry in India.—(a) The plastics industry in India has been largely developed during the last world war. Before the war, there were about a dozen moulding concerns manufacturing celluloid and other articles out of imported moulding powders and semi-fabricated plastic goods. The difficulty of importing moulding powders during the war led to the manufacture of phenol-formaldehyde moulding powder by a few concerns. The Government Electric Factory at Bangalore started manufacture of moulding powder on a pilot plant scale. Two other concerns also manufacture moulding powder ; one of them, the Indian Plastics, Ltd., Bombay, has hitherto manufactured it for its own requirements ; the other concern, the Plastic Products of India, Ltd., Satara, has not so far placed its product on the market. The Industrial Plastics Corporation, Bombay, alone produces phenol-formaldehyde powder on a commercial scale for supply to moulders. The other types of moulding powders and resins, such as urea-formaldehyde cellulose acetate, cellulose nitrate, cresol-formaldehyde and polystyrene, are all imported at present. There is no production of plastic sheets or laminates in India. A few machines for the production of tubes and rods have been installed in two or three factories, but their production is very limited. The manufacture of plastic articles comprises four branches, namely, (i) compression moulding ; (ii) injection moulding ; (iii) extrusion and (iv) fabrication. There are at present about 60 firms engaged in the manufacture of plastic goods under the four branches mentioned above.

(b) The plastics industry, as already observed, developed at a time when imports of finished plasticware were curtailed during the war. In the absence of the production of moulding powders and semi-fabricated goods, which, in turn, depends upon a well-developed chemical industry for supplying the necessary basic materials, only the moulding and fabricating sections of the industry, using imported raw materials, have been established. Apart from this drawback, the industry also suffers from certain other technical handicaps from the point of view of organisation, equipment and machinery. On the compression moulding side, for example, although a few machines have been recently installed, a number of obsolete machines is still operating at low levels of efficiency. Further, our cost investigation has disclosed that expenditure on repairs and maintenance is disproportionate to the value of the machinery and to the amount set aside for depreciation. The injection moulding side is limited to the production of utility articles such

wire which an

wire which an

wire which an

wire which an

wire which an

wire which an

The Indian manufacturers of phenol-formaldehyde powder adopt the 'batch' process, although recently a 'continuous' process has been developed in the United Kingdom. The required quantities of phenol and formaldehyde and a catalytic agent like sulphuric acid are added to a steam-jacketed reaction kettle. The kettle is heated to remove the water produced by the reaction. At the end of the reaction, the batch is taken out of the kettle, when it solidifies into the phenol-formaldehyde resin. This resin is ground to a fine powder. The finely crushed resin is then mixed in a mechanical dry mixer with hexamine, stearic acid salts, colours, and fillers (woodflour). The mixture is then fed into a hot roll-mixer such as the one used in rubber making. The complete mixing thus takes place and the mixture comes out in the form of flaked sheets. These flakes are then powdered to proper mesh, screened and packed. The finished powder becomes the raw material for the plastic moulders. Besides woodflour, which is mostly used, asbestos, mica and cotton flock are also used as fillers in order to give improved electrical properties, greater impact strength and increased resistance to heat and moisture.

8. Domestic demand for moulding powder.—At the public inquiry, a leading firm of importers put the annual consumption of moulding powders in the country at 600 tons of polystyrene and 400 tons of phenol-formaldehyde moulding powder. Another important firm estimated that, during 1948, the demand of the Indian plastics industry could be placed at 1,000 tons of moulding powder, but it expressed a doubt whether this quantity was actually consumed by the moulding sections of the industry in 1948 owing to intermittent production. This latter firm also stated that 30 to 40 per cent. of the powder was used for making electrical switches, ceiling roses, plugs and sockets and other electrical accessories; while the balance of 70 to 80 per cent. was used for the production of soap dishes, bottle caps, general fancy goods and utility articles. A small quantity of powder was also stated to be used in the manufacture of telephones and telephone accessories. The Director-General of Industries and Supplies also estimated the consumption of moulding powder to be 1,000 tons in 1948. Since the several estimates furnished to us varied considerably, the matter was discussed fully at the public inquiry. And it was agreed that the estimate of the consumption of phenol-formaldehyde moulding powder in India could be put at 1,000 tons in 1950, 1,500 tons in 1951, and 2,000 tons in 1952.

9. Domestic production of moulding powder.—As already stated in paragraph 5 above, the only firm engaged in the manufacture of phenol-formaldehyde moulding powder for sale to the moulders is the Industrial Plastics Corporation (TIPCO), Bombay. This firm started production in 1946. The present rated capacity of TIPCO is about 900 tons per annum on the basis of working two shifts. The actual production of phenol-formaldehyde moulding powder by this firm was, however, 85 to 90 tons in 1946, 72 tons in 1947, and 125 tons in 1948. The principal reason adduced by the manufacturer for his wide divergence between the rated capacity and actual production was that production could only be undertaken in the initial stages against an actual demand for the indigenous powder. Another reason given for the lag between the rated

capacity and actual production was that the price of TIPCO's powder was five to ten per cent. higher than that of the imported powder. Lastly, the manufacturer stated that the heavy imports of powder consequent upon its being placed on the Open General Licence since September 1943, was responsible for the low production in that year.

10. Quality of the indigenous phenol-formaldehyde moulding powder.—The evidence, both in the written memoranda and at the public inquiry, disclosed some difference of opinion regarding the quality of the indigenous moulding powder. The representatives of the industry stated that there are two kinds of phenol-formaldehyde moulding powder, namely, (i) phenol-formaldehyde powder used for general purpose and utility articles and (ii) phenol-formaldehyde moulding powder used in the manufacture of electrical accessories. Moulders of general purpose and utility articles stated that the Indian powder was satisfactory and compared favourably with the imported powder. Manufacturers of electrical accessories, however, complained that the Indian powder had a tendency to stick in the moulds with the result that considerable operation time was lost and that the moulded article lacked lustre. They also mentioned that electrical accessories made from Indian powder were suitable only for indoor purposes because of higher moisture absorption. They further stated that there was a specific standard for the powder used for electrical accessories and that uniformity of standards was important for their products. Because of production in small batches, the powder as produced by Indian manufacturers has not been of a uniform quality. This statement was also supported by representatives of certain importers who mentioned that the quality of the indigenous moulding powder was likely to be variable for certain technical reasons and that it was not possible to produce high-quality powder on a small scale. On the other hand, the Indian manufacturers of phenol-formaldehyde moulding powder, while conceding that there was room for improvement in the quality of the powder, contended that there was considerable prejudice against the use of the indigenous powder. There is no doubt about the existence of this prejudice, particularly in view of the statements made during the public inquiry by certain moulders that, their customers stipulated on their orders that the articles should be manufactured out of imported powder. It is also true that the Indian moulding powder industry is in its infancy and its products may not have attained the requisite uniformity in quality as compared with the imported powder. We would, however, like to impress on the moulding industry that it is in its own ultimate interest to encourage the development of the moulding powder industry in this country and that this can be done only by using Indian powder where possible, particularly in the case of such industrial articles where durability counts more than the finish or the outward appearance. If Indian moulders could evolve and adhere to a programme of priority in production, to which we refer later, indigenous powder could be more extensively used and developed, since such powder is and can be increasingly utilised in the manufacture of industrial articles.

11. Imports of moulding powder.—(a) *Statistics of imports.*—Imports of phenol-formaldehyde moulding powder during 1947 were estimated to be 200 tons and during 1948 1,000 tons. It was stated during the public inquiry that in 1946, fairly large quantities of phenol-formaldehyde powder had come into the country but that in 1947, supplies fell off considerably owing to the coal crisis and the consequent shortage of phenol in the United Kingdom. The quantity of 200 tons imported in 1947, however, seems to be on the low side. The Accounts relating to the Sea-borne Trade and Navigation of India do not furnish the requisite data for estimating the imports accurately. The Panel on Plastics and Celluloid Industries estimated that about 600 tons of moulding powder were imported annually in the pre-war period. The information furnished to us by the Collectors of Customs at Bombay, Calcutta and Madras, shows that the total imports of plastics during 1948-49 amounted in value to Rs. 55.65 lakhs, out of which moulding powders accounted for Rs. 26.58 lakhs. These figures also do not provide any reliable basis for assessing the quantity imported. So far as phenol-formaldehyde moulding powder (bakelite) is concerned, the sources of import at present are the United States and the United Kingdom. As regards the other kinds of powder also, the principal sources of import are the United States and the United Kingdom, although small quantities are also imported from other countries.

(b) *Position regarding import control.*—Imports of phenol-formaldehyde powder were subject to monetary ceiling from dollar and hard currency countries, whereas imports from sterling and soft currency countries were put under Open General Licence No. XI, from September, 1948. But, since the cancellation of Open General Licence XI on May 5, 1949, the licensing position about phenol-formaldehyde moulding powder remains to be defined. At the public inquiry, it was pointed out that, while phenol-formaldehyde powder was not on the O.G.L., cresol-formaldehyde was put on the O.G.L., but that there was not much difference between these two types of powders. We, therefore, desire to draw the attention of Government to the possibility of substitution of phenol-formaldehyde powder by cresol-formaldehyde powder and the necessity of placing both the powders on the same footing so far as import control is concerned.

12. Existing rate of customs duty.—According to item 87 of the Indian Customs Tariff (Thirtieth Issue), the present import duty on phenol-formaldehyde moulding powder, urea-formaldehyde moulding powder, cellulose nitrate, cellulose acetate, acrylic (methacrylate) casein, and polystyrene is 30 per cent. *ad valorem*.

13. **C.i.f. prices and landed costs.**—The following statement shows the c.i.f. prices, customs duty, clearing charges, landed costs and selling prices of phenol-formaldehyde moulding powder furnished by the Collectors of Customs as well as leading importers :—

Phenol-formaldehyde Moulding Powder.

Source of information	Country of origin and/or date of import	C.i.f. Price per cwt.	Customs duty.	Clearing charges	Landed cost.	Selling price per cwt.	C.i.f. price or landed cost per lb. with out duty
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
		<i>General purpose black and brown.</i>					
Bakelite (India), Ltd. Bombay ..	1948 ..	103 15 2	32 2 11 (30%)	2 1 3	137 3 4	141 12 0	0 15 2
Collector of Customs, Bombay ..	Jan., '49	92 8 0	..	..	..	..	0 13 3
Collector of Customs, Calcutta ..	USA-Feb., '48.	163 5 4	..	..	..	..	1 7 4
Collector of Customs, Madras ..	UK-12-11-'48.	93 5 4	..	..	..	..	0 13 4
		<i>Coloured</i>					
Bakelite (India), Ltd., Bombay ..	1948 ..	120 14 5	39 4 4 (30%)	2 9 11 (2%)	172 12 3	178 8 0	1 3 1
Volkart Bros., Bombay.	Oct./Nov. '48.	103 4 0	31 0 0 (30%)	3 6 0 (2½%)	137 10 0	158 1 4	0 15 3
I.C.I. (India), Ltd., Bombay ..	1948/49 ..	83 14 5	25 2 5	11 12 10	120 13 8	138 0 0	0 13 8
		<i>Unspecified.</i>					
Hindusthan Plastics, Ltd. Bombay ..	1949 ..	140 0 0	42 0 0	1 12 0	183 12 0	..	1 4 3
Universal Plastic Products, Bombay ..	Feb., '49..	86 5 4	25 10 8	1 12 0	113 12 0	..	0 12 7

14. **Board's estimate of cost of production and fair selling price of indigenous phenol-formaldehyde moulding powder.**—(a) In estimating the cost of production of phenol-formaldehyde moulding powder, we have taken into consideration certain factors which are described below :—

- (i) The firm started with one roll-mixer capable of producing 225 tons a year working one shift and later, supplemented the equipment with one more roll-mixer of an equal capacity. Though the present equipment can produce 450 tons a year working single shift, the actual output of moulding powder is low, as can be seen from the following figures :—

Year	Installed capacity (single shift)	Capacity worked	Actual production (single shift)
	Tons		Tons
1947-48	225	32%	72
1948-49	450	28%	125

(ii) Detailed cost accounts are not maintained by the firm, and the costs have, therefore, had to be built up on the basis of such data as were available. It has also not been possible to estimate separately the cost of production of moulding powder of different colours. Hence, the cost of production per lb. of phenol-formaldehyde moulding powder of all colours for the year ended 31st March, 1949, has been worked out.

(iii) As pointed out earlier, during 1948-49 the plant was worked out upto 28 per cent. of its capacity. As a major portion of the fixed overheads would have been observed had the factory worked to full capacity, adjustments have had to be made so as to relate the actual cost of production to the full rated capacity. This has been done with a view to showing the cost of production during 1948-49 on the assumption that the plant worked upto its normal capacity.

(b) The following statement shows the Board's estimate of the cost of production and fair selling price during 1948-49 as also its estimate of the cost of production and fair selling price during 1949-50 of phenol-formaldehyde moulding powder. In the estimated cost for raw materials, a reasonable allowance has been made for wastages due to small production and other handicaps.

THE INDUSTRIAL PLASTIC CORPORATION, BOMBAY

Board's estimates of the cost of production and fair selling price during 1948-49 and 1949-50 of phenol-formaldehyde.

Items of Cost	1948-49		*1949-50
	Cost per lb. based on the actual production, i.e., 2,78,329 lbs. or 124.25 tons	Cost per lb. related to a rated capacity of 10,08,000 lbs. or 450 tons, working single shift	Cost per lb. based on a production of 10,08,000 lbs. or 450 tons, working, single shift
	Rs.	Rs.	Rs.
(i) Cost of raw material (phenol, formaldehyde, hexamine, woodflour and other chemicals)	0.538	0.538	0.776
(ii) Labour	0.074	0.038	0.038
(iii) Overheads (inclusive of power, depreciation, supervision, etc.)	0.278	0.177	0.180
(iv) Packing	0.018	0.018	0.018
(v) Works cost	0.908	0.771	1.012
(vi) Return on fixed capital at 10 per cent. on a block of Rs. 1,28,415	0.046	0.013	0.013
(vii) Fair selling price	0.954 or Re. 0 15 3	0.784 or Re. 0 12 7	1.025 or Re. 1 0 5

*NOTE.—In regard to the estimates for 1949-50, the cost of phenol and formaldehyde has been taken at the prices offered for bulk quantities; cost of hexamine is based on the price stated to have been paid by TISCO for bulk quantities; the cost of other materials has been based on the prices paid during 1948-49; and the conversion cost has been calculated on the basis of working one shift.

(e) It will be seen from the statement in paragraph 12 above that the lowest landed cost, without duty, per lb. of phenol-formaldehyde moulding powder is Re. 0-12-7. This figure has been taken by us for the purpose of comparison of the fair selling price of the indigenous moulding powder with the landed cost, without duty, of the imported powder, as shown below :—

	Per lb.
	Rs. A. P.
(i) Fair selling price for 1949-50	1 0 5
(ii) C. i. f. price	0 12 4
(iii) Customs duty at 30 per cent.	0 3 8
(iv) Clearing charges	0 0 3
(v) Total landed cost	1 0 8
(vi) Landed cost, excluding duty	0 12 7
(vii) Difference between (i) and (vi)	0 3 10
(viii) Item (vii) as percentage on c. i. f. (ii)	81%

Thus, the difference between the Board's estimate of the fair selling price and the landed cost comes to Re. 0-3-10 or 31 per cent. on the c.i.f. price. As already stated, the present rate of import duty (revenue) on this powder is 30 per cent. *ad valorem*.

15. **Protection or assistance to the moulding powder industry.**—(a) The All-India Plastics Manufacturers' Association, in their representation to the Board, has asked for various measures of protection or assistance to the plastics industry as a whole. We briefly summarise them below, so far as they relate to the moulding powder industry :—

(i) Basic raw materials required for the manufacture of moulding powders, such as phenol, urea, styrene, formaldehyde and hexamine, should be imported duty-free.

(ii) As phenol-formaldehyde moulding powder is the only one at present manufactured in the country, and in view of large imports of this powder during 1948, no import of phenol-formaldehyde moulding powder should be allowed for a period of one year. At the end of the initial period of one year during which there should be a complete ban on imports of phenol-formaldehyde moulding powder, the existing rate of import duty of 30 per cent. on this powder should be increased to 80 per cent. and should be in force for one year, subject to the proviso that users of imported phenol-formaldehyde moulding powder should be entitled to a refund of one-half of the enhanced import duty of 80 per cent. ; i.e., they should be liable to pay a duty of 40 per cent. on the actual quantity of imported phenol-formaldehyde moulding powder consumed in the making of plastic goods. On the expiry of the period of one year during which the enhanced duty of 80 per cent. would be in

force, the duty on phenol-formaldehyde powder should be progressively reduced to 70 per cent., 60 per cent., and 50 per cent., respectively, at the end of each succeeding year and should be stabilised at the rate of 50 per cent. at the end of the fourth year.

(iii) In respect of such moulding powders, other than phenol-formaldehyde moulding powder, as are not manufactured in the country, the existing duty of 30 per cent. should be raised to 40 per cent. subject to the proviso that three-fourths of the duty of 40 per cent. should be refunded on the actual quantity of imported moulding powders used in the manufacture of plastic articles ; *i.e.*, a duty of 10 per cent. will only be payable on the quantity imported *and* used. The object underlying the imposition of a prohibitive duty and subsequent refund of a portion of the duty on phenol-formaldehyde moulding powder, was stated to be that only those actually engaged in the moulding of plastic articles would import the powder and then asked for a refund ; the representatives of the industry felt that there was otherwise a possibility of various persons not connected with the industry importing such powder and re-selling it to small moulders. The stipulation of the grant of refund of part of the duty on submission of evidence of actual utilisation of the imported powder would, therefore, prove a deterrent to the reselling of imported phenol-formaldehyde moulding powder.

(b) Apart from the administrative difficulty involved in carrying out the suggestion put forward for the imposition of a high duty and subsequent refund of part of that duty, no case has been made out for an increase in the existing duty on moulding powder on the basis of a comparison of the fair selling price of the indigenous phenol-formaldehyde moulding powder and the landed cost, without duty, of the imported powder. For, as will be seen from paragraph 14(c) above, the difference between the fair selling price of the indigenous product and the landed cost, without duty, of the imported powder works out to 31 per cent., as against the existing import duty of 30 per cent. The manufacturer argued that an allowance should be made in respect of prejudice against the Indian made powder. Although we recognise the force of this argument, we do not consider that a higher duty on phenol-formaldehyde moulding powder would be a satisfactory way of assisting this industry. We appreciate that the existing duty would not by itself be sufficient in the initial stages to enable the Indian manufacturers to compete effectively with foreign powders because the Indian manufacturers of phenol-formaldehyde moulding powder have to depend on imports from other countries for their basic raw materials and on which they pay duties ranging from 25 to 36 per cent. at present, while their competitors abroad have these materials available in their own countries. We would like to stress in this connection the importance of securing cheaper raw materials for the development of the moulding powder industry. In our opinion, this would be a more effective method of developing this industry than by imposing higher duties on imported moulding powder which would augment the cost of production of plasticware and make it more difficult for the Indian industry to compete with imported plastic goods. We might mention that this was also the view of the Australian Tariff Board

when it examined the case of the plastics industry in that country and since the absence of a fully-developed basic chemical industry in our country renders it necessary that the development of the plastics industry should take place by way of an expansion of the moulding powder and the moulding industries, it is advisable to make the cost of production of moulding powder cheaper through the refund of the whole of the duty on the principal chemicals imported and used as raw materials. It was also pointed out by the manufacturers of plasticware at the public inquiry that an increase in the existing duty on phenol-formaldehyde moulding powder should not be made applicable to the special type of powder required which is not at present being manufactured in India. It would be administratively difficult to distinguish between the general purpose moulding powder (G.P. grade) and powder required for the manufacture of electrical accessories (G.X. grade). Besides, the proposal for a refund of a portion of the enhanced duty might prejudicially affect manufacturers of plasticware who operate on a small scale and who cannot afford to import powders themselves. We are, therefore, opposed to any increase in the existing duty on phenol-formaldehyde moulding powder but favour the refund of the whole of the duties payable on the principal raw materials used in the manufacture of the powder, namely, (i) phenol, (ii) formaldehyde and (iii) hexamine, which are : 25 per cent. standard on phenol ; 36 per cent. standard and 26 per cent. preferential on both formaldehyde and hexamine. The refund of the duties, if granted, will also be in accordance with the policy already accepted by Government, by which raw materials required for industrial purposes are to be imported free of duty. We also recommend that this refund should be granted only to those manufacturers of moulding powder who produce a minimum of 200 tons of phenol-formaldehyde powder per annum. The refund should be allowed at the time of importation of the raw materials on the recommendation of the D.G., I. and S. It is necessary to lay down this condition of a minimum of production because the quality of the powder is likely to suffer if it is produced in very small quantities. Further, it will be administratively inconvenient to deal with applications for refund of duty on raw materials from producers on a small scale of whom there will be many if a minimum level of production is not prescribed.

(c) We are satisfied that the moulding powder section of the plastics industry fulfils the conditions laid down by Government in Resolution No. 218-T(55)45, dated 3rd November, 1945, referred to in paragraph 1(d) of this Report. Although the principal raw materials are not available in the country as yet, there are reasonable prospects of such materials being produced in the near future. There is also a very large home market for this product. The process of manufacture is simple and production can be expanded to meet the demand. We think that this section of the plastics industry has on the whole been conducted on sound business lines ; we must point out, however, that the principal unit, namely, the Industrial Plastics Corporation, Bombay, should be converted into a public limited company at an early date. We believe that there is a reasonable prospect for this section of the industry to develop sufficiently so as to dispense with protection or state assistance

in course of time. For these reasons, we consider that the moulding powder industry should be protected and the existing revenue duty of 30 per cent. *ad valorem* should be converted into an equivalent protective duty. We recommend that this duty should be in operation for the period ending 31st March, 1953.

(d) As there are at present large stocks of imported phenol-formaldehyde powder in the country, we recommend that, having regard to the balance of payments difficulties and the consequent need to regulate imports, imports of phenol-formaldehyde moulding powder for the remaining months of the year 1949 and for the year 1950 should be permitted only to the extent of the difference between the indigenous demand and the quantum of production. If this suggestion is accepted it may not be necessary to issue any licences for the next four to six months.

SECTION III—PLASTIC GOODS

16. **Raw materials.**—(a) The raw materials required for the production of plasticware may be divided into the following groups :—

- (i) Thermo-setting plastics, such as phenol-formaldehyde moulding powder (bakelite), urea-formaldehyde moulding powder ;
- (ii) Thermoplastics, such as polystyrene, cellulose acetate, polyvinyl chloride, casein ;
- (iii) Sheets, tubes and rods made of cellulose acetate, cellulose nitrate (celluloid), and casein.

(b) As already pointed out, only phenol-formaldehyde moulding powder is at present manufactured in the country. When the Government Fertilizer Factory at Sindri (Bihar) comes into production in 1950-51, it is expected that about 3,000 tons of urea would be produced part of which could be used for the manufacture of urea-formaldehyde moulding powder. Casein manufactured in India on a small scale, but it is of the lactic and not the rennet variety required for the plastics industry. So far as cellulose acetate is concerned, when the acetate rayon plant at Hyderabad is installed, it may be possible to get cellulose acetate from the factory for the plastics industry. The production of celluloid or cellulose nitrate has also been undertaken on an experimental scale at the Government Cordite Factory at Aruvankadu. A few machines for the production of tubes or rods have been installed in two or three factories, but the production has not yet reached a commercial scale. Apart from phenol-formaldehyde moulding powder, the other raw materials comprise urea-formaldehyde moulding powder, polystyrene, cellulose acetate, cellulose nitrate, acrylic (methacrylate), and casein, polyvinyl chloride, and other resins. These are not at present produced in the country. It will thus be seen that, except phenol-formaldehyde moulding powder, all other powders and resins as well as semi-fabricated articles are imported at present.

(c) In addition to moulding powders, the manufacturers of electrical accessories also require brass parts and spring steel wire. Except for

a small quantity which is locally manufactured, these metallic parts are at present imported.

(d) The manufacture of moulds is the most important item in the manufacture of plastic goods. Moulds are not at present manufactured in India on any appreciable scale.

17. Process of manufacture.—The four processes of manufacture of plasteware adopted in India are (a) compression moulding, (b) injection moulding, (c) extrusion, and (d) fabrication. These processes are briefly described below :—

(a) *Compression moulding.*—In this process, a measured quantity of moulding powder is placed in a mould which forms a part of the moulding press. The press may be operated electrically, hydraulically or manually. The moulds are made of special steel and are available with a single or a large number of cavities. The mould is heated electrically or by steam to a temperature required by the type of moulding powder used. Under pressure of the moulding press, the powder is moulded into the required shape within a specified time known as the 'curing period'. At the end of this curing period, the article is removed from the mould. After this, the article is filed to remove the excess overflow powder and it is then polished and buffed if required. In the case of electrical accessories, various inserts made of brass and steel are introduced into the articles. These brass inserts are manufactured in the factory or purchased. For inserting these metallic parts, it is necessary to have the plastic articles filed and drilled. The assembly of brass parts forms a separate process in this branch of production.

(b) *Injection moulding.*—Thermoplastic materials like polystyrene and cellulose acetate are used in this process. The injection machines are automatic, semi-automatic, or manually operated. The powder melts within the machine and flows through the runner into the various cavities which make up the mould. A 'curing period' is required, at the end of which the mould is opened up and the article taken out, filed and finished. The runners can be reground and utilised again in view of their thermoplastic character.

(c) *Extrusion.*—This process is mainly used for the production of ribbons, tubes and rods. The thermoplastic material under conditions of regulated temperature and pressure is allowed to extrude out of dies which give various sizes and shapes as required.

(d) *Fabrication.*—This process consists of fabricating articles of various designs from semi-fabricated raw materials like sheets, tubes and rods. The material goes through various operations such as working on a lathe, cutting, bending, polishing, buffing, colouring and assembling by means of adhesives.

18. Domestic demand.—The consumption of plastic goods in India before the last war was estimated to be about 500 tons. According to the All-India Plastics Manufacturers' Association, the consumption of plasticware has now gone up to 4,000 tons, of which about 3,000 tons are at

present manufactured in India and the balance imported. It has also been stated by the Association that the demand for plasticware is likely to increase to 5,000 tons a year in the near future. The present demand for plasticware is mostly for utility articles. The various estimates of domestic demand were fully discussed at the public inquiry. In estimating this demand, we have taken into consideration the pent-up demand which should have been satisfied by the excessive imports during 1948. We have also made allowance for various factors such as the future industrial development of the country, particularly in regard to radio, telephone, automobile and aircraft manufacture as well as for electrification schemes. After taking into account all these factors, we consider that the total demand for the Indian Union can be put at 4,000 tons of plastic goods per annum during the next three or four years. Of this quantum of demand, nearly 75 per cent. may be estimated for domestic and utility articles and about 25 per cent. for industrial articles, including electrical accessories.

19. Domestic production.—It has not been possible to arrive at an accurate estimate of the rated capacity as well as the actual production of plasticware in the country. This is due to the fact that the figures of production furnished to us have not been expressed uniformly in one unit, some estimates being given in tons and others in numbers, and still others in value. This renders it difficult to assess the total production in quantitative terms. The All-India Plastics Manufacturers' Association has stated that the present rated capacity of the plastics industry is about 5,200 tons per annum, while the D.G., I. & S., has put it at 4,000 tons a year. The details of the two estimates are given below :—

Type	Number	Capacity	Total consuming capacity of raw materials.
(A) Estimate of the All-India Plastics Manufacturers' Association.			
			tons
1. Compression	170	3,700 tons pressing capacity.	1,500
2. Injection	120	300 ounces	3,000
3. Extrusion	20	Ranging from 1" to 4" ..	700
4. Fabrication .. ..	..	
Total .. ..	..	..	5,200
Estimate of the D.G., I. and S.			
1. Compression	210	Not furnished	2,000
2. Injection	72	..	1,500
3. Extrusion	11		
4. Fabrication .. ..	..	..	500
Total .. ..	..	..	4,000

As far as the figures of actual production are concerned, no official statistics are available. In reply to the Board's questionnaire, about 20 manufacturers submitted their figures which are given in Appendix IV. The All-India Plastics Manufacturers' Association has estimated the production of all plasticware for the three years 1946, 1947 and 1948 as follows.—

									Production in tons
1946	..	..	..	..	..	..	..	..	800
1947	..	..	..	..	..	..	..	..	2,000
1948	..	..	..	..	..	..	..	..	3,000

The D.G., I. and S., on the other hand, estimates the actual production in 1948 to be 1,100 tons. After discussion of this question in detail at the public inquiry, we have come to the conclusion that the rated capacity of the Indian moulding factories can be put at 4,000 tons of finished plasticware per annum and that the actual production in 1948 was about 1,500 tons.

20. Quality of indigenous plasticware.—The quality of the finished plasticware depends in a large measure upon the quality of the moulding powder and other intermediate products used in manufacture, although the technique of manufacture would also make some difference. Normally, there should be little difference between articles made of imported powders and resins on the one hand and imported finished articles on the other hand. The difference, if any, might be in regard to the finished or lustre which also depends upon the quality of the moulds used. Even in regard to the articles made of indigenous moulding powder, the All-India Plastics Manufacturers' Association has contended that Indian-made plastic goods are in no way inferior to imported articles. According to the Association, this is particularly the case with electrical accessories such as wall plugs, switches and cut-outs. It has also been pointed out to us that indigenous knitting needles are even superior to imported ones. During the war the industry supplied plastic articles to the Government of India, and since then also consumers have continued to use Indian-made plastic goods. Some witnesses at the public inquiry maintained, however, that consumers preferred imported goods since foreign manufacturers adhered to technical specifications and recognised standards. The D.G., I. and S., has stated that, while the quality of the indigenous electrical accessories was not as good as that of the imported ones, there was considerable consumer's prejudice against Indian electrical accessories. We are of the opinion that, while a certain amount of prejudice does exist against Indian-made electrical accessories, these goods compare favourably with imported ones. With improvement in the quality of the moulds and better machinery and equipment as well as with better technique of manufacture and standardisation of products, and a planned programme of development, we have no doubt that the quality of the indigenous plasticware will reach the standard of imported articles.

21. Imports.—(a) *Statistics of imports.*—At present, plasticware is not shown as a separate item in the Indian Customs Tariff. Plastic goods fall under item 87 "All other articles not otherwise specified"

in Section XXII of the First Schedule to the Indian Customs Tariff (Thirtieth Issue). At the same time, some of the articles made of plastic materials fall under different items according to their names, as will be seen from the extract in paragraph 22 below. We had, therefore, to undertake a special investigation in co-operation with the Collectors of Customs at Bombay, Calcutta and Madras for the compilation of the necessary figures. Despite these efforts, the figures which could be obtained only related to the value of all kinds of plastics. The total value of imports of plastics of all kinds, including moulding powder, during 1948-49, was Rs. 35.65 lakhs out of which imports of plasticware alone accounted for Rs. 15.07 lakhs. For the maintenance of adequate statistics of imports of all kinds of plastic goods into India, it is necessary that plastic goods should be classified as indicated in paragraph 31(g) hereafter.

(b) *Import control position regarding plasticware and basic raw materials.*—According to a notification dated 22nd February, 1949, issued by the Ministry of Commerce, no licences are to be granted for import of plasticware from dollar and hard currency areas while imports from sterling and soft currency countries are subject to a monetary ceiling. Certain basic raw materials for plastic manufacture have, however, been put under the Open General Licence XV from 19th May, 1949, for imports from sterling and soft currency areas, and these comprise cellulose acetate sheets and moulding powders, cresol-formaldehyde moulding powder and synthetic resins in the manufacture of which formaldehyde, phenol, cresol and urea are used.

22. *Existing rates of duty.*—Various articles made of plastic material are included at present in items 28(14), 56, 73, 73(1), 77(4) and 87 of the Indian Customs Tariff (Thirtieth Issue). These items are given below, together with the names of the plastic articles falling under the particular item:—

Item No.	Name of article.	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of		
				The U.K.	A British Colony	Burma
28(14)	Toilet requisites not otherwise specified (Toilets and soap boxes)	Revenue	57½% ad. val.	..	..	10% ad. val.
56	*Parasols and Sunshades and fittings for umbrellas, parasols and sunshades (Umbrella handles)	Revenue	*30% ad. val.	..	..	12% ad. val.
73	Electrical Instruments, apparatus and appliances, not otherwise specified excluding telegraphic and telephonic (calling) cases and lamp holders and plugs)	Plastic is at Revenue.	36% ad. val.	24% ad. val.	..	19% ad. val.

Item No.	Name of article.	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of		
				The U.K.	A British Colony	Burma
73(1)	The following Electrical Instruments, apparatus and appliances, namely :— Electrical Control Gear and Transmission Gear, viz., switches (excluding switch boards), fuses and current breaking devices of all sorts and descriptions, designed for use in circuits of less than ten amperes and at a pressure not exceeding 250 volts; and regulators for use with motors designed to consume less than 187 watts; insulated copper wires and cables, any one core of which, not being one specially designed as a pilot core, has a sectional area of less than 1/80th part of a sq. in. and wires and cables of other metals of not more than equivalent conductivity; and line insulators, including also cleats, connectors, leading-in tubes and the like, of types and sizes such as are ordinarily used in connection with the transmission of power for other than industrial purposes, and the fittings thereof but excluding electrical earthenware and porcelain otherwise specified. (Switches)	Preferential Revenue.	36% ad. val.	24% ad. val.	..	12% ad. val.
77(4)	Optical Instruments, apparatus and appliances† (spectacle frames)	Revenue	20% ad. val.	..	..	10% ad. val.
87	All other articles not otherwise specified, including articles imported by post ‡ § (cellulose acetate, cellulose nitrate, acrylic, (methacrylate) casein, polystyrene, phenol-formaldehyde and urea-formaldehyde moulding powders and resins, semi-fabricated articles such as rods, tubes and belting)	Revenue	30% ad. val.	..	..	12% ad. val.

*Under Government of India, Finance Department (Central Revenues), Notification No. 1-Customs, dated the 9th March 1946, fittings for umbrellas, parasols and sunshades are exempt from payment of so much of the customs duty leviable thereon as is in excess of 15 per cent. ad valorem.

†This is a GATT item.

(‡) Under Government of India, Finance Department (Central Revenues), Notification No. 2-Customs, dated the 24th February, 1945, holite and cellulose acetate sheets are exempt from so much of the duty as is in excess of the duty leviable on printing and lithographic material.

(§) Under Government of India, Finance Department (Central Revenues), Notification No. 1-Customs dated the 9th March, 1946, as subsequently amended by Govt. of India, Ministry of Finance (Revenue Division), Notification No. 40-Customs, dated the 18th September, 1948, celluloid, raw, for the manufacture of dressing combs, asbestos, raw, including fibre, Bristles for brush making, including artificial or synthetic bristles, Dumnuts for the manufacture of buttons and Carbon black for the manufacture of printing ink and black paint are exempt from the payment of the customs duty leviable thereon.

It will be seen from the above statement that the present import duty on moulding powders and resins is 30 per cent. *ad valorem*, which is also the duty on semi-fabricated plastic goods. Electrical accessories, such as plugs, ceiling roses and switches, bear a standard duty of 36 per cent. on non-British and 24 per cent. on British imports. Combs and soap-boxes, which at present fall under 'toilet requisites', bear a duty of 37½ per cent., while umbrella handles are subject to a duty of 15 per cent. It was pointed out during the public inquiry that laminated sheets imported from the United Kingdom and used for general purpose plasticware bear a duty of 30 per cent., while laminated sheets used for insulation in electrical accessories bear a duty of 24 per cent. Moreover, while the duty on cellulose acetate and cellulose nitrate is 30 per cent., cellulose acetate imported for making combs is exempt from customs duty. It was stated that cellulose acetate of the same quality is required for making combs as well as spectacle frames; and that, while it is exempt from duty when imported for making combs, cellulose acetate or cellulose nitrate is subject to a duty of 30 per cent. when imported for making spectacle frames. The existing import duty on finished spectacle frames, on the other hand, is 20 per cent. This constitutes a tariff anomaly in that the duty on raw material is higher than that on finished products made out of it.

23. **C.i.f. prices and landed costs.**—The following statement shows the c.i.f. prices and landed costs of representative items of plasticware imported into India. These figures have been obtained from the Collector of Customs at Madras, as well as from importers:—

Name of the article.	Country of origin and/or date of import	c.i.f. price.	Customs duty	Clearing charges.	Landed Cost.
1	2	3	4	5	6
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Furnished by the Collector of Customs, Madras.</i>					
1. Switches	(UK-12/1/49)	9 0 0 per doz	..	..	..
2. Bed switches	UK-18/4/49	8 12 0 ..	..	..	..
3. Miniature switches	UK-18/4/49	6 8 0 ..	..	..	..
4. Bell pusher .. ..	..	7 8 0 ..	..	..	..

1	2	3	4	5	6
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Furnished by the Electrical Merchants' Association, Bombay.</i>					
5. All-Bakelite switches ..	Japan (1949)	3 0 0 per doz	1 1 3 (36%)	0 1 5	4 2 8
6. All-Bakelite switches ..	Germany(1949)	7 5 0 ..	2 8 4 (36%)	0 1 8	9 10 0
7. All-Bakelite switches ..	UK 1949	8 0 0 ..	1 14 9 (24%)	0 1 3	10 0 0
8. All-Bakelite switches ..	France (1949)	8 0 0 ..	2 14 1 (36%)	0 1 11	11 0 0
9. All-Bakelite switches ..	Italian (1949)	5 0 0 ..	1 12 9 ((36%)	0 2 0	4 14 9
10. Bakelite ceiling roses ..	Japan (1949)	2 8 5 ..	0 14 7 (36%)	0 0 7	3 7 0
11. Bakelite ceiling roses ..	Germany(1949)	.. per doz	..	..	4 13 0
12. Bakelite ceiling roses ..	U.K. (1949)	4 8 0 ..	1 1 3 (24%)	0 0 9	5 10 0
13. Bakelite plug tops ..	Japan (1949)	1 10 0 ..	0 9 4 (36%)	0 1 0	2 4 4
14. Bakelite plug tops ..	U.K. (1949)	3 4 0 ..	0 12 6 (24%)	0 0 6	4 1 0
15. Plugs with porcelain base ..	16/6/48	15 0 0 ..	..	..	..
16. Combs 7" ..	USA (16-3-48)	0 12 8 ..	..	..	..
17. Combs 7" ..	"	0 10 9 ..	..	..	..
18. Plastic button ..	UK. (4-2-49)	19 2 8 per gross	..	..	..
19. Wall Plugs with hand shield type Plug tops ..	U.K.-1949	8 0 0 per doz	1 14 9	0 1 3	10 0 0
20. Wall Plugs without hand shield type plugs tops ..	U.K.-1949	6 0 0 ..	1 7 0	0 1 0	7 5 0
21. Lamp holders ..	U.K.-1949	5 0 0 ..	3 3 2	0 0 10	6 4 0
<i>Furnished by the Collector of Customs, Bombay.</i>					
22. Soap Boxes ..	U.K.-1917-48	5 5 4 .. 0 10 8	Break-up not available)		
23. Knitting needles ..	U.K. June 1949.	20 15 0 per gross	6 4 6	0 3 4	27 6 10

24. Method of costing.—(a) The factories selected by the Board for cost investigation have been mentioned in paragraph 3(b) above.

Since a proper system of accounting does not exist in most of the factories, the costs have had to be built up with such data as were available. In respect of each factory costed, the accounts relating to the period during which production was fairly normal have been taken as the basis. The cost of production of plasticware has been worked out in relation to each department or section of the factory, such as the press or moulding shop, machine shop, finishing and assembly departments, and packing. Direct expenses, as well as common or general expenses, have, as far as possible, been apportioned to the producing department or section concerned. The total expenses of each department or section have been spread over the number of machine-hours or man-hours in each process of manufacture. On the basis of the average production per machine-hour or man-hour, the process cost of the respective article has been arrived at. To this process cost have been added the cost of raw material, the cost of moulds, and the costs of packing, the sum-total of these costs being the total works cost of the individual finished plastic article. To this works cost has been added provision in respect of depreciation and interest on working capital, the resulting figure being the total cost of production. The fair selling price has been arrived at by adding to the total cost of production a provision in respect of a return on fixed capital.

(b) In calculating the cost of the raw material, where the moulding powder or the semi-finished material has been purchased or imported by the firm from different suppliers at different rates, the weighted average rate per lb. of such material has been taken. In the Board's estimate of the cost of production for 1949-50, the price of phenol-formaldehyde powder has been taken at Rs. 2,660 per ton or Rs. 1.188 per lb., and the price of polystyrene at Rs. 3,580 per ton or Rs. 1.598 per lb., these prices being the selling prices offered by the I.C.I. (India), Ltd. The price of casein (rennet type) for knitting needles has been taken at Rs. 1,515 per lb. being the rate at which the only manufacturer has obtained his supplies from the United Kingdom. Depreciation has been provided at the rates allowed for income-tax purposes ; interest on working capital has been allowed at 4 per cent. on four months' cost of production; and return on fixed capital has been allowed at 10 per cent. The detailed report on the cost investigation is being submitted separately.

25. Board's estimate of costs of production and fair selling prices of plastic-ware other than spectacle frames.—The following statement shows the costs of production and fair selling prices of representative articles manufactured by six Indian firms as well as the average cost of production and fair selling prices of each of the articles:—

Board's estimates of costs of production and fair selling prices of indigenous plastic goods for 1949-50.

	Soap boxes per doz.		Ceiling roses per doz.		Wall plugs per doz.		Switches per doz.		Combs per doz.		Lamp Holders		Knitting needles	
	Cost of production.	Fair Selling Price	Cost of production.	Fair Selling Price	Cost of Production.	Fair Selling Price	Cost of production.	Fair Selling Price	Cost of production.	Fair Selling Price	Cost of Production.	Fair Selling Price	Cost of production.	Fair Selling Price
Indian Plastics, Ltd. Bombay.	Rs. 2-636	Rs. 2-772	Rs. 4-726	Rs. 5-038	Rs. ..	Rs. ..	Rs. ..	Rs. 1-084	Rs. 1-162	Rs. ..	Rs. ..	Rs. ..	Rs. ..	Rs. ..
Hindusthan Plastics Ltd., Bombay.	3-013	3-232	5-865	6-293	10-442	11-049	..	0-758	0-786	..	..	..	..	..
The Government Electric Factory Bangalore.	2-931	3-043	4-867	4-748	11-305	11-600	..	0-828	0-870	..	..	..	..	..
Plastic Products, Ltd., Kanpur.	..	..	4-983	5-298	10-614	11-478	7-231	..	..	6-476	7-001	..	..	..
Plastic Moulders Ltd., Calcutta.	..	..	..	..	..	..	..	0-783	0-814	..	..	..	..	..
Dominion Plastic Industries, Bombay.	..	..	..	..	..	..	..	..	..	..	..	26-738	27-839	27-839
Average	2-860	3-016	5-066	5-344	10-787	11-376	7-231	0-863	0-908	6-476	7-001	26-738	27-839	27-839

26. **Cost of production of spectacle frames.**—(a) The following figures of demand and production of finished plastic spectacle frames have been furnished to us by the All-India Spectacle Manufacturers' Association :—

	Quantity	Value
		Rs.
(i) Total demand of finished plastic frames	7,50,000	15,00,000
(ii) Total production by Indian manufacturers	5,50,000	10,00,000
(iii) Cellulose nitrate sheets imported	50 tons	5,00,000
(iv) Components (nickel silver hinges, wire rivets, screws, etc., required for 7,50,000 frames) .. .. .	..	1,50,000

(b) On the basis of the data-supplied, the cost of production of each pair of spectacle frames fabricated from cellulose nitrate sheets has been worked out as shown in the following statement :—

Item of cost	Types of spectacle frames		
	Zylo Round	Fulvue	Library
	Rs. A. P.	Rs. A. P.	Rs. A. P.
(i) Cellulose nitrate sheets	1 4 0	2 4 0	3 0 0
(ii) Components (hinges and wire)	0 7 0	0 7 0	0 12 0
(iii) Polishing materials and chemicals	0 3 0	0 5 0	0 6 0
(iv) Labour charges	0 12 0	1 2 0	3 0 0
(v) Rent, electricity, etc.	0 2 0	0 2 0	0 6 0
Total	2 12 0	4 4 0	7 8 0

27. **Claim for protection or assistance to the indigenous plasticware industry.**—The All-India Plastics Manufacturers' Association, in its memorandum, has asked for the imposition of a total ban on imports of such items of plasticware as are manufactured in the country, including electrical accessories. Alternatively, the Association has submitted that a duty of 80 to 100 per cent. should be imposed on all such finished plastic goods for a period of at least five years. In regard to electrical accessories, the Association has also asked for a refund of the duty on brass parts used in their manufacture. Besides, the Association has claimed high railway priority for transport of plastic goods.

28. **Comparison between c.i.f. prices and fair selling prices.**—The question of protection or assistance required for the finished plasticware industry should be considered separately in respect of the following items:—

(i) General purpose and utility articles.

(ii) Electrical accessories.

(iii) Spectacle frames.

(a) *General purpose and utility articles.*—Under this heading, we have taken the following articles as representative items for the purpose of comparison of the landed costs of imported products with the fair selling prices of indigenous products:—

(i) Soap boxes.

(ii) Combs.

(iii) Knitting needles.

The average fair selling prices in respect of each of the items produced by different factories which have been costed have been taken for the purpose of comparison. The following statement gives the fair selling price estimated by the Board along with the landed cost ex-duty, of imported soap boxes, combs and knitting needles:—

Board's estimate of fair selling prices for the year 1949-50 and landed costs of soap boxes, combs, and knitting needles.

	Soap boxes, square, made of phenol-formal- dehyde moul- ding powder.	Combs, 7" (Gents), made of polystyrene.	Knitting needles made of casein.
	Per doz.	Per doz.	Per gross pairs
	Rs. A. P.	Rs. A. P.	Rs. A. P.
(A) Fair selling price	3 0 3	0 14 6	27 13 5
(B) (1) C. i. f. price .. .. .	..	0 10 9	20 15 0
(2) Customs duty .. .. .	..	0 4 0	6 4 6
(3) Clearing charges .. .. .	..	0 0 3	0 3 4
(4) Total landed cost .. .. .	..	0 15 0	27 6 10
(5) Landed cost, ex-duty .. .. .	..	0 11 0	21 2 4
(C) Difference between (A) and (B) (5) .. .. .	..	0 3 6	6 11 1
(D) Percentage of (C) on the c.i.f. price (B)			
(1) .. .. .	..	32.6	32.0
(E) Existing duty	37½%	37½%	30.0%

(b) *Electrical accessories.*—The following articles have been taken by us as representative items of electrical accessories manufactured in India for the purpose of comparison of fair selling prices and landed costs:—

- (i) Ceiling roses.
- (ii) Wall plugs.
- (iii) Switches.
- (iv) Lamp holders.

Electrical accessories made only from plastic material have been included in these categories.

Board's estimates of fair selling prices for 1949-50 and landed costs of, electrical accessories made of phenol-formaldehyde moulding powder.

	Ceiling roses per doz.	Wall plugs. per doz.	Switches per doz.	Lamp holders per doz.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
(A) Fair selling price	5 5 6	11 6 0	7 13 7	7 0 0
(B) (1) C. i. f. price	4 8 0	*7 0 0	8 0 0	5 0 0
(2) Customs duty	1 1 3	1 10 11	1 14 9	1 3 2
(3) Clearing charges	0 0 9	0 1 1	0 1 3	0 0 10
(4) Total landed cost	5 10 0	8 12 0	10 0 0	6 4 0
(5) Landed cost, ex-duty	4 8 9	7 1 1	8 1 3	5 0 10
(C) Difference between (A) and (B) (5)	0 12 9	4 4 11	0 3 8	1 15 2
(D) Percentage of (C) on c.i.f. (B) (1)	17.7 or 18%	61.5 or 62%	(—)2.9 or (—)3%	39.0%
(E) Existing duty	36% std. 24% Pref.	36% std. 24% Pref.	36% std. 24% Pref.	36% std. 24% Pref.

*As indigenous manufacturers have both the types of wall plugs, the average c.i.f. price of wall plugs with hand shield and ordinary plugs has been taken.

(c) *Spectacle frames.*—It has not been possible to obtain a break-up of the landed cost with duty of spectacle frames. The fair selling prices of spectacle frame made from imported cellulose nitrate sheet and the landed costs of imported spectacle frames as furnished to us are given below:—

	For a complete spectacle frame		
	Zylo Round	Fulvue	Library
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Fair selling price	2 12 0	4 4 0	7 8 0
Landed cost	2 4 0	3 4 0	6 0 0
Existing duty on spectacle frames	20%	20%	20%

29. Protection or assistance recommended.—(a) General purpose and utility articles, soap boxes, combs, knitting needles.—The statement under sub-paragraph (a) of paragraph 28 above shows that the existing duty of 37½ per cent. on soap boxes and combs, and 30 per cent. on knitting needles provides sufficient protection to the indigenous articles. It has, however, been contended by the manufacturers that considerable prejudice exists against Indian-made plasticware. Although we recognise the existence of such prejudice, we do not consider it advisable to recommend any increase in the existing duty on finished plasticware so as to offset this disadvantage. The primary objective of the plastics industry should be to expand the domestic market for plastic goods. Assistance to this industry should, in our opinion, be given in other ways than by an increase in the import duty on these types of plastic goods. For instance, such assistance can be afforded through the abolition of or reduction in import duties on such moulding powders and semi-fabricated articles as are not made in India. Raw materials and powders other than phenol-formaldehyde, such as urea-formaldehyde, polystyrene, cellulose acetate, cellulose nitrate, polyvinyl chloride, and semi-fabricated plastic material such as sheets, rods and tubes, are not at present produced in India. But, with the development of the Government fertiliser factory at Sindri and the working of the various schemes of research in the development of indigenous plastics materials as well as the establishment of a larger unit for manufacturing moulding powders, we may expect to have indigenous raw materials made available to the industry. We do not, therefore, favour abolition of the import duty even on such raw materials as are not produced in the country at present. We are of the opinion that the plasticware industry can be assisted if the import duty on such raw materials, both moulding powders (other than phenol-formaldehyde powder) and semi-fabricated raw materials such as sheets, tubes and rods, as are not manufactured at present in the country, is reduced from the present level of 30 per cent. *ad valorem* to 20 per cent. *ad valorem*. And we, therefore, recommend that the duties on moulding powders (other than phenol-formaldehyde moulding powder) and semi-fabricated raw materials such as sheets, tubes, and rods, should be reduced from 30 per cent. to 20 per cent. *ad valorem*. In this connection, we may refer to the Ministry of Commerce letter No. 38-T(1)|47, dated 21st October, 1948 (paragraph 1(d)), wherein the Board has been asked to examine the abolition or reduction in the duty on celluloid, cellulose acetate and cellulose butyrate used in the manufacture of plastic goods. As we have recommended a reduction in the duty on moulding powders (other than phenol-formaldehyde moulding powder) and semi-fabricated raw materials such as sheets, tubes and rods which are not manufactured at present in the country, we also recommend that the import duty on celluloid, cellulose acetate and cellulose butyrate should be reduced from 30 per cent. *ad valorem* to 20 per cent. *ad valorem*.

(b) *Electrical accessories.*—It will be seen from the statement in paragraph 28 that the difference between the fair selling price and the landed cost ex-duty works out to 62 per cent. for wall plugs, 18 per cent. for ceiling roses, minus 3 per cent. for switches (the fair selling price

being lower than the ex-duty landed cost), and 39 per cent. for lamp holders. In order to arrive at a uniform basis in respect of all electrical accessories, we have taken the weighted average rate which works out as follows :—

Item.	Quantity*	Percentage of duty
Wall plugs, complete	12,000	62.0
Ceiling roses	15,000	18.0
Switches	12,000	(—)3.0
Holders	10,000	39.0
Weighted average rate of duty		28.0

*Quantity has been taken on the basis of actual production during 1948 as furnished to us.

Thus the average rate of duty required on electrical accessories works out to 28 per cent., as against the existing standard rate of 36 per cent. and the preferential rate of 24 per cent. This average rate of 28 per cent. does not cover any provision in respect of prejudice as also the disadvantage suffered by the Indian manufacturers in regard to railway freight on raw materials and finished articles. But the same arguments which we have urged in respect of general purpose and utility articles in sub-paragraph (a) above hold good in this case also. Since, however, electrical accessories, and especially certain categories of them suffer from foreign competition after the imports were put on the Open General Licence, we consider that there is a case for an increase in the preferential rate of duty on finished electrical accessories. We, therefore, recommend that the duty on electrical accessories made of plastic material should be converted from a revenue into a protective duty and that the preferential rate should be increased from 24 per cent. *ad valorem* to 30 per cent. *ad valorem* in respect of imports from the United Kingdom the standard rate of 36 per cent. *ad valorem* being adjusted in terms of the Indo-British Trade Agreement of 1939. We also recommend that the new rates of duty should be in force until 31st March, 1953.

(c) *Spectacle frames*.—As we have already pointed out there is a tariff anomaly in respect of this article. While the duty on finished frames is 20 per cent., the duty on the raw material used is 30 per cent. The raw material for making spectacle frames is either cellulose acetate or cellulose nitrate. The Indian manufacturers of spectacle frames use cellulose nitrate which is stated to be more suitable for Indian conditions. Under the foot-note to item 87 of the Indian Customs Tariff (Thirtieth Issue), according to a Notification dated 18th September, 1948, celluloid, raw (cellulose nitrate) imported for the manufacture of dressing combs, is exempt from the payment of customs duty. The

manufacturers of spectacle frames contended that the same concession should be extended to cellulose acetate or cellulose nitrate imported for the manufacture of spectacle frames. We consider this claim to be reasonable. We do not recommend any increase in the existing duty on finished spectacle frames on the same grounds as are applicable to finished plasticware. In sub-paragraph (a) above, we have recommended that the duty on cellulose acetate and cellulose nitrate should be reduced from 30 per cent. to 20 per cent. The reduction in the duty, if given effect to, will also be applicable to these raw materials imported for manufacture of spectacle frames. Incidentally, it will rectify the existing tariff anomaly to which we have already drawn attention. Such a reduction will bring down the rate of duty on these raw materials to the same level as the duties on the other raw materials required for finished plasticware. There is another aspect of the exemption of duty on celluloid, raw, for manufacture of dressing combs, referred to above, to which we would like to draw the attention of Government. With the increasing tendency for using polystyrene in the manufacture of combs, celluloid combs are not in demand and this concession regarding import duty is, in effect, inoperative. Although this matter does not fall strictly within the scope of our inquiry, we feel that the concession in regard to the duty on celluloid, raw, imported for manufacture of dressing combs might give rise to complaints about discrimination between products manufactured out of the same imported raw material. We, therefore, suggest for the consideration of Government that the duty payable on celluloid, raw, for manufacture of dressing combs should also be raised to 20 per cent.

(d) In regard to the demand for import control made by the manufacturers of plasticware, we consider that there is no need for quantitative regulation of imports of plasticware except in so far as such restrictions have to be maintained owing to balance of payment difficulties.

30. Eligibility for protection.—(a) The conditions to be satisfied by the plastics industry in order to become eligible for protection or assistance have been stated in paragraph 1(b) above. The first condition to be fulfilled is that the industry is established and conducted on sound business lines. We are satisfied that the plastics industry in India is conducted on sound business lines, although we must point out that there is considerable room for improvement both in its commercial and technical organisation.

(b) The second condition to be fulfilled falls into two parts: (i) that, having regard to the natural or economic advantages enjoyed by the industry and its actual or probable costs, it is likely within a reasonable time to develop sufficiently to be able to carry on successfully without protection or state assistance; or (ii) that it is an industry to which it is desirable in the national interest to grant protection or assistance and that the probable cost of such protection or assistance to the community is not excessive. In regard to the first part, as has already been pointed out, the finishing sections of the industry have developed before the establishment of the industries supplying intermediate and

basic raw materials, so that the plasticware industry is almost entirely dependent on imported raw materials, machinery and moulds. We must, however, point out that such a development is in no way unusual, because in other countries also, such as Australia, the moulding sections were established before the development of industries supplying intermediate and basic raw materials. Production of one type of moulding powder is already being undertaken to some extent in the country. Moreover, there is every possibility of developing indigenous sources of raw materials for the production of plastic goods. India is favourably placed so far as forest and agricultural resources are concerned, and these have potentialities for supply of raw materials for the production of plastic goods. Although coal distillation has not so far been started in the country, it has good prospects of development and would make available a number of chemical raw materials. The agricultural and forest resources as well as the development of the chemical industry would provide in course of time adequate basic and intermediate materials for the plastics industry. Among the indigenous raw materials, which have potentialities of development, may be mentioned lac, cashew-shell oil, bhilawan oil, and casein. We have been informed that lac, suitably treated, produces a moulding composition somewhat similar to bakelite in many of its properties, while the conversion of cashew-shell oil in combination with varying proportions of bhilawan shell liquid into a semi-solid resin has been patented. Some of these raw materials are being exported and have been utilised for industrial purposes in the plastics industry of the United States of America. We endorse the opinion expressed by the Panel on Plastics and Cellulose Industries that "India possesses the resources necessary for the production of raw materials required for the synthetic plastics industry and has, in addition, an abundance of naturally occurring resins and resin-forming materials." While the industry is to-day dependent on imported materials, it has reasonable prospects of being self-reliant in the future. We are, therefore, satisfied that the plastics industry fulfils conditions 2(a) referred to in paragraph 1(b).

(c) The industry also fulfils condition 2(b), namely, that it is in the national interest to grant protection or assistance to it and that the probable cost of such protection or assistance to the community is not excessive. For, the plastics industry creates a large demand for several products of the basic chemical industries and influences the development of such industries. The extensive use of plastics as basic material for industrial and constructional purposes has placed plastic products on an almost equal footing with other raw materials, such as metal, wood, glass and stone. The variety of plastic goods, which can be produced is almost unlimited and there is, therefore, no reason why it should not have an expanding market in the coming years, particularly with industrial development and improvement in the general economic condition of the country. In view, therefore, of the close relation of the plastics industry with basic chemical industries, whose development is vital to national security, we are of the opinion that it is in the country's interest to grant protection or assistance to the plastics industry.

31. Subsidiary recommendations.—For the development of the plastics industry in the country on healthy lines, we consider that certain steps should be taken in order to improve the organisation of the industry from the technical and commercial points of view. We deal with these measures below:—

(a) *Central moulding-powder factory.*—Moulding powders and resins are the chief raw materials used in the manufacture of plastics and account for nearly half the total cost of production. It is, therefore, necessary that moulders should be able to obtain in the country moulding powders and resins at prices comparable with those of imported powders. The Development Committee on Plastics as well as the Report of the Delegation of Plastics Manufacturers to the United Kingdom and the United States of America have recommended the establishment of a single large unit producing moulding powders in the country. We understand that this recommendation is under the active consideration of the industry and of the Government of India. As the consumption of moulding powders in India is small, economical production will be possible only if the manufacture of such powders is centralised in such a manner as to co-ordinate the production of the existing units with any new unit that may be established. We, therefore, recommend that early steps should be taken to bring this scheme into operation, so that production of various types of moulding powders and resins can be undertaken in gradual stages in pursuance of a programme.

(b) *Central mould-making shop.*—As already pointed out, mould-making is an integral part of the plastics industry. Apart from the fact that the manufacture of moulds is a highly specialised job, the special alloy steel of the requisite quality has to be imported. Moreover, the full capacity of the mould shop attached to a factory cannot be utilised in the production of moulds required by the factory and would not, therefore, be economical. The Panel on Plastics and Celluloid Industries recommended that, initially, two centralised mould shops should be set up with necessary equipment under the guidance of properly trained engineers and designers. It has also been suggested that the central mould shop for the plastics industry might form part of the proposed Government Machine Tool Factory. In the course of the public inquiry, some witnesses did not favour the idea of having one central mould-making factory because they felt that the mould was a trade secret. It was also mentioned that a centralised heat-treatment shop for the moulds would be of considerable assistance to the industry, because heat-treatment is an expensive process which every moulder of plastic articles cannot afford. The majority of moulding factories in the country cannot afford to have separate mould-making shops for themselves. Moreover, since industrial articles are standardised, there would be no difficulty in manufacturing moulds for such articles on a common pattern. We, therefore, consider that the scheme for having a central mould-making shop as part of the proposed Central Machine Tool Factory should receive early and favourable consideration of Government. Such a central mould-making shop will also lead to standardisation of plasticware and rationalisation in its production.

(c) *Programme of priority in the production of plasticware.*—The D.G., I. and S., has stated that about 6 per cent. of the total production of plasticware in 1948 represents industrial accessories and the balance, utility articles. The Development Committee on Plastics has suggested that a programme of priority should be laid down in regard to production of plasticware in India, on the following lines: (i) electrical accessories; (ii) industrial articles such as those required for the textile, automobile and aircraft industries, bottle caps, sanitary fittings; and (iii) domestic and utility articles, such as combs, soap boxes and buttons. At the public inquiry, the manufacturers of plastic goods stated that, while in principle they were agreeable to a programme of priority of production, they did not consider it practicable in the present conditions because of the limited market for industrial goods. It is true that the domestic market for industrial plastic articles has not yet sufficiently developed, except in respect of articles required by railways and for electrical purposes. But the plastics manufacturers themselves recognised that the low standard of living in this country with the consequent restricted demand constitutes a handicap for the industry. We are, therefore, of the opinion that the objective should be to produce industrial articles and utility goods which are in demand and are within purchasing power of the people rather than luxuries and novelty wares. We, therefore, recommend that steps should be taken, both by Government and the industry, for the formulation of a suitable programme of priority of production. Incidentally, this will also assist the programme of manufacture and regulation of imports of moulding powders.

(d) *Research in plastics.*—It is hardly necessary for us to emphasise that research both on synthetic and natural plastics is fundamental to the development of this industry. In view of the rapid pace at which new types of synthetic plastics are being evolved and marketed all over the world, it is essential for the Indian manufacturers of plastics to keep abreast of technical developments in other countries. It is satisfactory that basic research is being conducted under the auspices of the Council of Scientific and Industrial Research. The Ministry of Industry and Supply, Government of India, has also been taking a keen and continuous interest in the development of this industry on its technical side. Courses in plastics manufacture are being conducted at the Department of Chemical Technology of the University of Bombay. We also welcome the proposal to have a separate section for research in high polymers, cellulose and other synthetic plastics in the National Chemical Laboratory to deal with the urgent practical problems facing the plastics industry. The establishment of two Cellulose Research Institutes to deal with problems of cellulose raw materials, recommended by the Panel on the Rayon Industry, should also go a long way in assisting the industry. We wish, however, to point out that the plastics industry also must co-operate in such research schemes by setting aside funds for pilot plant experiments in order to introduce new materials and processes.

(e) *Technical personnel.*—Lack of technical personnel is a serious handicap from which the industry is suffering. Both the memorandum

of the All-India Plastics Manufacturers' Association and the Report of the Delegation of Plastics Manufacturers to the United Kingdom and the United States of America have laid stress on the importance of providing adequate training in the technique of production of plastics. We have been informed that, under the Education Ministry's scheme for technical training, it has been proposed that four students would be sent, during 1949, to the United Kingdom and the United States of America for training in various branches of the industry, including cellulose products and mould designing. It has also been suggested that during 1950 one student should be sent abroad for training in mould designs of plastics. We welcome these measures and recommend that schemes of technical training in plastics should be continued in consultation with the plastics industry for the next five years. We have been informed that the Government of India have under consideration the appointment of a suitable plastics expert to assist the manufacturers. We recommend that this proposal should be implemented without delay.

(f) *Necessity for prescribing standard specifications.*—No standard specifications have been laid down for the manufacture of moulding powders or for plasticware in this country. We understand that a few practical tests are being conducted by the only manufacturer of phenol-formaldehyde moulding powder for commercial purposes, namely, the Industrial Plastics Corporation, Bombay, before the power is placed on the market. It has been stated that the proper standard for phenol-formaldehyde moulding powder for general purpose is B.S.S. 771 but that the Indian-made powder does not conform to any standard. In respect of plasticware also, no standards have yet been laid down. We have been informed that a Sub-Committee of the Indian Standards Institution is engaged in working out specifications for electrical accessories. The Indian Stores Department has been the principal consumer of electrical accessories. We understand that it adopts the British Standard Specification. The Indian products do not, however, always come up to this standard. We recommend that early steps should be taken by the industry for the formulation and enforcement of proper standards both in respect of moulding powder and finished articles.

(g) *Classification of plastic articles in the Customs Tariff and maintenance of adequate statistics of imports of such articles.*—As we have pointed out earlier, considerable difficulty was experienced by us in assessing the value and volume of imported plastics goods, including moulding powder, owing to the fact that at present, the figures show only the total value of imports from different countries of all plastic commodities, namely, raw-materials, semi-fabricated articles, and finished articles. At present, plastic goods fall under item 87 "All other articles

not otherwise specified," in Section XXII of the First Schedule of the Indian Customs Tariff (Thirtieth Issue). Under this item some cellulose acetate, cellulose nitrate, casein, polystyrene, moulding powders and resins, and semi-fabricated articles such as sheets, rods and tubes. But, as will be seen from the extract in paragraph 22, some of the articles made of plastic materials fall under different items according to their names. We consider it necessary to ascertain accurately the nature of competition from imports of goods in respect of which protection or assistance has been or may be claimed in future. For the purpose of inclusion in the Indian Customs Tariff as well as for maintaining adequate statistics in the Accounts relating to the Sea-borne Trade and Navigation of India, we recommend that plastic goods of all descriptions should be separately shown as indicated below :—

Plastics.—

(A) Moulding powders and resins :—

- (i) Phenol-formaldehyde moulding powder ;
- (ii) Urea-formaldehyde moulding powder ;
- (iii) Cellulose acetate, cellulose nitrate, cellulose butyrate ;
- (iv) Polystyrene ; casein ;

(B) Semi-fabricated plastic materials :—

- (i) Sheets, tubes and rods ;
- (ii) Any other semi-fabricated material made of plastic not otherwise specified.

(C) Finished plastic goods :—

- (i) Utility articles : soap boxes, combs, buttons, knitting needles, fittings for umbrellas ;
- (ii) Industrial accessories: Electrical accessories—wall plugs, ceiling roses, switches, lamp holders ;
- (iii) Spectacle frames ;
- (iv) Any other article made of plastic substances not otherwise specified.

The new item comprising "Plastics" as shown above can conveniently be incorporated as item 85(2) under the heading "Miscellaneous Goods and Products not elsewhere included" in Section XX of the First Schedule of the Indian Customs Tariff.

SECTION IV.—SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

32. Our conclusions and recommendations may be summarised as under :—

(1) The inquiry covers the following branches of the plastics industry : moulding powders and resins, semi-fabricated materials, and finished articles of all descriptions. (Paragraph 2).

(2) The economic development of the plastics industry is a matter of importance both on its own account and because of its influence on the development and maintenance of basic chemical industries. (Paragraph 4).

(3) The only type of moulding powder whose manufacture was undertaken during the last world war is phenol-formaldehyde powder, using imported raw materials. In the absence of the production of other moulding powders and semi-fabricated goods, which in turn, depends upon a well-developed chemical industry supplying the necessary basic materials, only the moulding and fabricating sections of the industry, using imported raw materials, have been established. (Paragraph 5).

(4) The estimated consumption of phenol-formaldehyde moulding powder in the country can be put at 1,000 tons in 1950, 1500 tons in 1951, and 2,000 tons in 1952. (Paragraph 8).

(5) The rated capacity of the only firm engaged in the manufacture of phenol-formaldehyde moulding powder on a commercial scale is 900 tons per annum on the basis of working two shifts. (Paragraph 9).

(6) It is in the ultimate interest of the moulding section of the plastics industry to use indigenous powder wherever possible, particularly for making industrial articles where durability counts more than the finish or the outward appearance. (Paragraph 10).

(7) The difference between the fair selling price of the indigenous product and the landed cost, without duty, of the imported phenol-formaldehyde moulding powder does not justify an increase in the existing duty of 30 per cent. *ad valorem*. [Paragraph 15(b)].

(8) We recommend that in the absence of a fully-developed chemical industry supplying the basic raw materials for the moulding powder section of the industry, and in order to reduce the cost of production of moulding powder, the manufacturers of such powder should be allowed a refund of the whole of the duties payable on the principal raw materials used in the manufacture of the powder, namely, (i) phenol, (ii) formaldehyde and (iii) hexamine, which are : 25 per cent. standard on phenol : 36 per cent. standard and 26 per cent. preferential on both formaldehyde and hexamine. [Paragraph 15(b)].

(9) This refund of duty on raw materials should be granted, at the time of the importation of the raw materials on the recommendation of the D.G., I. and S., only to those manufacturers of moulding powder who produce a minimum of 200 tons of phenol-formaldehyde moulding powder per annum. [Paragraph 15(b)].

(10) The moulding powder section of the plastics industry fulfils the conditions of eligibility for grant of protection or assistance. We recommend that the existing revenue duty of 30 per cent. *ad valorem* should be converted into an equivalent protective duty and the protective duty kept in force until 31st March, 1953. [Paragraph 15(c)].

(11) The only unit manufacturing moulding powder on a commercial scale, namely, the Industrial Plastics Corporation, Bombay, should be converted into a public limited company at an early date. [Paragraph 15 (c)].

(12) Having regard to the existence of large stocks of imported phenol-formaldehyde moulding powder at present in the country as well as to the need for conserving foreign exchange, imports of phenol-formaldehyde moulding powder during 1949 and 1950 should be permitted only to the extent of the difference between the indigenous demand on the one hand and the quantum of production and stocks of imported powder on the other. On this basis, no licences for import of phenol-formaldehyde powder should be issued for the remaining period of 1949. [Paragraph 15(d)].

(13) Except phenol-formaldehyde moulding powder, the raw materials for the manufacture of plastics goods, namely, moulding powders and resins as well as semi-fabricated articles and moulds, are at present imported. (Paragraph 16).

(14) The total demand for plastic-ware for the Indian Union can be put at 4,000 tons per annum during the next three or four years ; of this total, nearly 75 per cent. would be for domestic and utility articles and about 25 per cent. for industrial articles, including electrical accessories. (Paragraph 18).

(15) The rated capacity of the Indian moulding factories can be put at 4,000 tons of finished plastic-ware per annum ; the actual production in 1948 was about 1,150 tons. (Paragraph 19).

(16) Indian-made plastic goods compare favourably with imported ones. There is, however, a certain amount of prejudice against Indian electrical accessories. (Paragraph 20).

(17) In view of the need to expand the domestic market for plastic goods, assistance to the industry should be given in other ways than by

an increase in the import duty. An increase in the duty is not also justified by the difference between the estimated fair selling price of indigenous plastic-ware and its landed cost. [Paragraph 29(a)].

(18) The section of the industry manufacturing plastic goods such as soap-boxes, combs and knitting needles, including spectacle frames, should be assisted by the grant of a reduction in import duty on such raw materials, both moulding powders and resins (other than phenol-formaldehyde powder) and semi-fabricated materials, as are not manufactured at present in the country, from the present level of 30 per cent. *ad valorem* to 20 per cent. *ad valorem*. The raw materials coming under this description are: urea-formaldehyde moulding powder, polystyrene cellulose acetate, cellulose nitrate, cellulose butyrate, polyvinyl chloride, casein, resins other than phenol-formaldehyde resin, sheet, rods and tubes. [Paragraphs 29(a) and 29(c)].

(19) In view of the fact that celluloid, raw, has been largely substituted by polystyrene in the manufacture of dressing combs, the notifications dated 9th March, 1946, and 1st September, 1948, granting exemption of import duty on celluloid, raw for manufacturing dressing combs, which now falls under item 87 of the First Schedule to the Indian Customs Tariff (Thirtieth Issue), should be amended so as to be in accordance with recommendation (18) above ; i.e., the rate of duty on celluloid, raw should be 20 per cent. *ad valorem*. [Paragraph 29(c)].

(20) In respect of electrical accessories, such as wall plugs, switches, ceiling roses and lamp holders, the existing revenue duty should be converted into a protective duty, the present preferential rate of 24 per cent. in respect of imports from the United Kingdom being increased to 30 per cent. and the standard rate being adjusted in accordance with the terms of the Indo-British Trade Agreement of 1939. The protective duties should be in force until 31st March, 1953. [Paragraph 29(b)].

(21) In regard to spectacle frames, the existing revenue duty of 20 per cent. should continue. [Paragraph 29(c)].

(22) There should be no restriction of imports of plastic-ware of all descriptions, except when such restriction is necessary owing to balance of payments difficulties. [Paragraph 29(d)].

(23) The plastics industry is conducted on sound business lines. India possesses the resources necessary for the production of raw materials required for the synthetic plastics industry and has, in addition, an abundance of naturally occurring resins and resin-forming materials. In view of the close relation of the plastics industry with basic chemical industries whose development is vital to national security, it is in the country's interest to grant protection or assistance to the plastics industry (Paragraph 30).

(24) Our recommendations in regard to the rates of duty on imports of phenol-formaldehyde moulding powder and plastic-ware as well as of raw materials for their manufacture, together with the existing rates, are shown below :—

Name of the Article	EXISTING RATE		PROPOSED RATE	
	Revenue	Protective	Revenue	Protective
(A) MOULDING POWDERS AND RESINS AND RAW MATERIALS :—				
(a) Phenol-formaldehyde moulding powder	30 per cent. ad valorem.	..	..	30 per cent. ad valorem.
(b) Urea-formaldehyde moulding powder, polystyrene, cellulose acetate, cellulose nitrate, cellulose butyrate, polyvinyl, casein, resins other than phenol-formaldehyde resin, sheets, rods and tubes.	30 per cent. ad valorem.	..	30 per cent. ad valorem.	30 per cent. ad valorem.
(c) Phenol	25 per cent. ad valorem	..	..	..
(d) Formaldehyde and hexamine	36 per cent. standard.	..	..	Refund of duty at the time of importation on the recommendation of the I.C., I. and S. to a unit producing a minimum of 200 tons of phenol-formaldehyde moulding powder.
	26 per cent. preferential for U.K. & British Colony.	..	..
(B) PLASTIC GOODS :—				
(a) General purpose and utility articles.—				
(i) Combs and soap-boxes	37½ per cent. ad valorem.	..	37½ per cent. ad valorem.	..
(ii) Knitting needles	30 per cent. ad valorem.	..	30 per cent. ad valorem.	..

(iii) Umbrella handles .. .. .	..	..	..	..	20 per cent. ad valorem.	..	20 per cent. ad valorem.	..
(iv) Spectacle frames .. .. .	..	..	..	..	20 per cent. ad valorem.	..	20 per cent. ad valorem.	..
(v) All other articles not otherwise specified	..	..	..	..	30 per cent. ad valorem.	..	30 per cent. ad valorem.	..
(6) Electrical accessories.—	..	..	..	..	..	..	..	20 per cent. preferential for U.K.; the standard rate according to the Indo-British Trade Agreement, 1939.
(i) Wall plugs, switches, ceiling roses and lamp holders	..	..	..	..	35 per cent. standard.	..	..	..
(ii) All other electrical accessories made of plastics	..	..	..	..	24 per cent. pref. for U.K.	..	..	..

*According to the footnote to item 56 "Parasols and Sunshades and fittings for umbrellas, parasols and sunshades", of the First Schedule to the Indian Customs Tariff (Thirtieth Issue), under Government of India, Finance Department (Central Revenue), Notification No. Customs, dated the 9th March, 1946, fittings for umbrellas, parasols and sunshades are exempt from payment of so much of the customs duty leviable thereon as is in excess of 15 per cent. ad valorem.

(25) Early steps should be taken to bring into operation the scheme for the establishment of a central moulding powder factory, which will also coordinate the production of the existing unit as well as any new unit that may be established, so that economical production of various types of moulding powders and resins can be undertaken in gradual stages in pursuance of a programme. [Paragraph 31(a)].

(26) In view of the necessity for standardisation of plasticware and rationalisation in its production, particularly in respect of industrial articles like electrical accessories, the scheme for having a central mould-making shop as part of the proposed Central Machine Tool Factory should receive early and favourable consideration of Government. [Paragraph 31(b)].

(27) In view of the low standard of living in the country and the consequent restricted demand for plasticware, the objective should be to produce industrial articles and utility goods which are in demand and are within the purchasing power of the people rather than luxuries and novelty wares. For achieving this objective, steps should be taken, both by Government and the industry, for the formation of a suitable programme of priority of production of plastic goods. [Paragraph 31(c)].

(28) In view of the rapid pace at which new types of synthetic plastics are being evolved and marketed all over the world, it is essential that Indian manufacturers of plastics should keep abreast of technical developments in other countries. [Paragraph 31(d)].

(29) The plastics industry must co-operate in the various schemes of research in plastics by setting aside funds for pilot plant experiments in order to introduce new materials and processes. [Paragraph 31(d)].

(30) The Education Ministry's scheme of sending students to the United Kingdom and the United States of America for training in various branches of the plastics industry, including cellulose products and mould-designing, should be continued. The proposal of the Government of India to appoint a suitable plastics expert to assist the manufacturers should be implemented without delay. [Paragraph 31(e)].

(31) Early steps should be taken by the industry for the formulation and enforcement of proper standards both in respect of moulding powder and finished articles. [Paragraph 31(f)].

(32) In view of the difficulty of ascertaining accurately the nature of competition from imports of plastic goods in the absence of adequate

statistics, it is necessary that plastic goods of all descriptions should be separately shown in the Indian Customs Tariff and in the Statistics relating to the Sea-borne trade and Navigation of India as shown in paragraph 31(g).

33. **Acknowledgments.**—The Board wishes to record its appreciation of the co-operation given by representatives of the industry. The Board's thanks are also due to Mr. N. Srinivasan, Deputy Development Officer, Ministry of Industry and Supply, Mr. K. Narasimhan, Assistant Collector of Customs, Bombay, Mr. S. S. Mehta, Technical Adviser attached to the Board, and Mr. S. V. Rajan, Cost Accountant, for their assistance at various stages of the inquiry.

G. L. MEHTA, *President.*

B. V. NARAYANASWAMY, *Member.*

R. DORAISWAMY, *Secretary.*

Bombay, the 13th August, 1949.



APPENDIX I

[Vide paragraph 3(a)].

List of persons, firms, associations and others to whom questionnaires were issued and from whom memoranda or replies were received.

In addition to all the Provincial Governments and Chambers of Commerce, questionnaires were issued to the following producers, consumers, importers and associations known to be directly connected with the industry.

(*) Those who replied or sent memoranda.

(†) Those who are not interested.

Producers :—

- *1. All India Plastics Manufacturers' Association, Podar Chambers, Parsee Bazar St., Bombay.
- †2. Alembic Chemical Works Company, Ltd., Baroda.
3. All India Glass Works, 111, Bhandari St., Bombay.
- †4. Angelo Bros., Ltd., P.O. Box 68, Calcutta.
- †5. Ashwinoid, Godbunder Road, Jogeshwari, Bombay.
- †6. Alema Plastics, Dehad.
7. Agfa Plastics, Maharani Road, Indore.
- *8. All India Optical Association, C/o Takandas, H. Kataria, 172, Hornby Road, Bombay.
9. Avacum, Lloyds Building, Dougall Road, Ballard Estate, Bombay.
- *10. Bharat Plastics Ltd., 6 Old Post Office St., Calcutta.
11. Bright Bros., Ltd., 156-A, Tardeo Rd., Bombay.
12. Bharat Industries, 397-A, Lamington Rd., Bombay 4.
- *13. Bharadia Plastic Industries, Jamnagar.
14. Gipra Bakelite Co., Routwadi Mughul Lane, Bombay.
- *15. Combined Services, 4-C, Connaught Place, New Delhi.
- †16. Kanpur Industries, Civil Lines, Kanpur.
17. Collins & Co., 144, Hornby Rd., Fort Bombay.
- *18. Dominion Plastics Industries, Chowpatty Chambers, Sandhurst Bridge, Bombay, 7.
19. Dhiraj Pen Manufacturing Co., Ltd., 15, Shamset St., Bombay 2.
- *20. Electrical & Allied Industries (Travancore) Ltd., Electric House, Cantt., Trivandrum.
21. Forward Industrial Works, Ltd., Saraswati Bhavan, Kama Road, Ghatkopar.
22. Germania Brass Factory, Ashapura Road, P.B. No. 7, Jamnagar.
23. Great India Plastics, 70 Dadiseth Agiari Lane, Bombay.
24. Ganesh Electric Engineering, Janmabhoomi Chambers Fort, Bombay.
25. Govt. Electric Factory, Mysore Road, Bangalore City.
- *26. Hindustan Plastics Ltd., Podar Chambers, Parsee Bazaar St., Bombay.
- *27. Hindustan Plastic Company, 8 Royal Exchange Place, Calcutta.
- *28. Hindustan Plastics Industries, 26-4 Samuel St., Vadgadi, Bombay.
- *29. Hind Plastic Works Ltd., 16 Pageyanatty St., Calcutta, 7.
30. M. Dutta & Sons (India Oil Plastics Ltd.), 15-Clive St., Calcutta.

31. H. Raney & Sons, Sambava Chambers, Sir P. M. Rd., Fort, Bombay.
- *32. Indian Electrical Manufacturers' Association, 23-B, Netaji Subhas Road, Calcutta.
- *33. Indian Plastic Ltd., Imperial Bank Annexe, Bank St., Fort, Bombay.
- *34. India Moulding Co., C-2, Bharat Bhavan, Chittaranjan Avenue, Calcutta.
- *35. India Reconstruction Corporation, Kanpur.
- *36. India Electric Works, Ltd., Diamond Harbour Rd., Behala, 24 Parganas.
37. Indian Industrial Co., Routwadi, Mahim, Bombay.
38. J. J. Eng. Co., 22, Gowalia Tank Road, Bombay 26.
- †39. Jessore Comb Industry Co., 2 Musalmanpara Lane, Calcutta.
- *40. Kay Eng. Co., Kapurthala.
41. Kiran Fountain Pen Co., Shamset St., Javeri Bazar, Bombay.
- *42. Laxmi Plastics, Kapadgaon Village, Phalton State, Lonand, M.S.M Rly.
43. L. K. Plastics, 7 Eros Building, Churchgate St., Bombay.
- *44. Mhatre Pen & Plastic Industries, 182 Gaiwadi, Girgaum, Bombay 4.
- *45. Maniar Plastics Industries, 63-3rd Bhoiwada, Bombay 2.
46. Mould-o-Plast Works, Dadiseth Road, Malad, Bombay.
47. Mahendra Plastics, 40, Girgaum Rd., Bombay 4.
48. Naran Products, Post Box 118, Ahmedabad.
- *49. National Eng. & Electroplating Works, 5th Khetwadi, 9th Lane, Khetwadi Back Rd., Bombay 4.
- *50. National Moulding Co., 20 Upper Chitpur Rd., Calcutta.
51. National Plastic & Allied Industries, Kitab Mahal, Hornby Rd., Bombay.
- *52. New Era Mfg. Co., Ltd., Palghat.
- *53. Osham Industries, 302, Kalbadevi Road, Bombay 2.
- *54. Oriental Plastic Corporation, Agra Road, Ghatkopar, G. I. P. Rly., Bombay.
- *55. Plastic Products Ltd., Kamla Tower, P.O. Box 25, Kanpur.
56. Panchal Steel & Bakelite Industries Ltd., Dhobi Ghat, Tulsiwadi, Tardeo, Bombay.
- *57. Pioneer Plastic Works, 16, Brojodulal St., Calcutta.
- *58. Plastic & Industrial Corporation Ltd., Post Box No. 1930, Amar Building, Sir P.M. Road, Bombay.
- *59. Plastics Manufacturers, 43 Sir Horiram Goenka St., Calcutta.
- *60. Plastics Moulders Ltd., 67-B, Netaji Subhas Road, Calcutta.
- *61. Plastic Metal Moulding Co., Ualvir Mansion, Harvey Road, Bombay.
- *62. Prakash Metal Works, 59, 2nd Dubash Lane, Vithalabhai Patel Rd., Bombay 4.
- *63. Prestolite, Ghodhunder Rd., Andheri, Bombay.
64. P. M. Wishkeer & Co., Opp. Cotton Exchange Bldg., Kalbadevi Rd., Bombay.
65. Plastico, 235-37, Walkeshwar Rd., Bombay.
66. Premraj Hazarimull, 8 Santhu Mullick Lane, Calcutta.

- 67. Prajesh Plastic Industries, 61 Sonawalla Estate, Goregaon (East), Bombay.
- *68. Plastic Products of India Ltd., 251, Bhawanipeth, Satara City.
- *69. Rubaco Industries, Behramji Mansion, Sir P. M. Road, Bombay.
- 70. Sri Lakshmana Plastic Works, Karanthai, Tanjore.
- 71. Star Bakelite Mfg. Co., Dhobi Talao, Bombay.
- *72. Swadeshi Industries Ltd., 33 Netaji Subhas Road, Calcutta.
- *73. Synthetic Moulders Ltd., 11 Armenian St., Calcutta.
- *74. Swastik Plastic Products, 513 Shanwar, Poona 2.
- 75. Sardar Plastics Industries, Mongeri St., Thana, Bombay.
- *76. The Industrial Plastics Corporation (TIPCO), 20, Apollo, St., Fort, Bombay.
- *77. Universal Plastic Products, 11 Worli Road, Bombay.

Importers.

- 1. Atlantis (East) Ltd., 41 Chowringhee Road, Calcutta.
- 2. Abdul Karim Esufally, Abdul Rehman St., Bombay.
- 3. Asian Textiles, Kermani Bldg., Sir P. M. Road, Bombay.
- 4. Arco Agencies, 35 Raghunath Dadaji St., Off Gunbow St., Fort, Bombay.
- *5. Bakelite (India) Ltd., United Life Bldg., Sir P. M. Road, Bombay.
- 6. British Paints (India) Ltd., P.B. 738, Calcutta.
- 7. British Electric Insulating Co. Ltd., 33 Forbes St., Bombay.
- 8. Dadaji Dhackjee & Co., Shree Pant Bhuvan, Sandhurst Bridge, Bombay 7.
- 9. Devdas Nandlal, Abdul Rehman St., Bombay.
- 10. Damania Trading Co., Lohar Chawl, Bombay.
- 11. Electricals (India) Ltd., 24-B, Hamam St., Bombay.
- *12. Electric Merchants' Association, Bhangwadi, Kalbadevi Rd., Bombay.
- *13. F. W. Pollack, Marino Villa, Wodehouse Road, Bombay.
- †14. G. Atherton and Co., 28 Apollo St., Fort, Bombay.
- †15. Govendram Bros., Seksaria Chambers, Meadow St., Bombay.
- *16. Hindustan Plastics Ltd., Podar Chambers, Parsee Bazar St., Bombay.
- *17. Indian Plastics Ltd., Imperial Bank Annexe, Bank St., Fort, Bombay.
- *18. Imperial Chemical Industries, Dougall Rd., Ballard Estate, Bombay.
- 19. Industrial Plastics & Moulding Co., Vithal Sayana Bldg., Bombay 2.
- 20. Jiwatram Kundanmul, Kalbadevi Road, Bombay.
- 21. Karimbhoy Dohadwalla, Abdul Rehman St., Bombay.
- 22. Kekubhai Govindji, 132., Kika St., Bombay 4.
- 23. Kodak Ltd., Kodak House, Hornby Road, Bombay.
- 24. Modi & Modi Co., Hamam St., Bombay.
- 25. Mahmed Ahmed, Abdul Rehman St., Bombay.
- 26. Manubhai & Co., Vithalwadi, Bombay.

27. Muhmed Ahmed Bros., Cutlery Bazar, Bombay.
28. Metal Box Co., of India Ltd., B 2 Hide Road, Kidderpore.
29. Monsanto Chemicals Ltd., C/o P. K. Dundas & Co., Jehangir Wadia Bldg., Mahatma Gandhi Rd., Bombay.
30. New York Trading Co., Bombay Mutual Annexe, Bombay.
31. P. M. Wishkoor, & Co., Opp. Cotton Exchange Bldg., Kalbadevi Rd. Bombay 2.
32. Pierce Leslie & Co., Ltd., Alleppey, Travancore.
33. Prestman Ltd., Great Social Bldg., Sir P. M. Rd., Bombay.
- †34. Rajsi Brothers, Opp. Electric House, Colaba Causeway, Bombay.
35. Sanghani & Co., 128-17 Abdul Rehman St., Bombay 3.
36. Scott & Pickstock Ltd., 2 Clive Ghat St., Calcutta.
37. Sharma Trading Co., Lohar Chawl, Bombay.
38. Shamsunder Kishandas & Co., Ltd., 45/47 Devkaran Mansion, Princess St., Bombay.
- *39. Trinity Electric Syndicate, Princess St., Bombay.
40. Tera Trading, Ashok Bldg., Princess St., Bombay 2.
41. Universal Trading, Co., 79 Princess St., Bombay.
42. Uppal & Company, Roshanara Road, Sabzimundi, Delhi.
- *43. Volkart Brothers, Graham Road, Ballard Estate, Bombay.

Consumers.

1. Aryan Brush Co., Lantin Chambers, Dalal St., Bombay.
- *2. Bombay Silk Mills, Colaba, Bombay.
3. Bombay Agency, Bombay.
- *4. Bombay Stationery Mart. Sir P. M. Road, Bombay.
- *5. Crompton Parkinson (Works) Ltd., Haines Rd., Bombay.
- *6. Cipla, Belasis Road, Bombay.
7. D. D. Italia, Shamsett St., Jhaveri Bazar, Bombay.
- *8. Group Laboratories (India) Ltd., Mahim, Bombay.
9. Ideal Agencies, 233 Abdul Rehman St., Opp. Sutar Chawl, Bombay. bay.
- †10. Kaycee Industries, Asian Bldg., Ballard Estate, Bombay.
- *11. Manubhai & Co., 94 Vithalwadi, Kalbadevi Rd., Bombay.
- †12. Rajsi Brothers, Farm House, Opp. Electric House, Colaba Causeway, Bombay.
- †13. P. Framrose & Sons, 11, Bank St., Fort Bombay.
14. Shree Shakti Mills, Haines Rd., Bombay.
- †15. Swadeshi Co-operative Stores, Sir P. M. Road, Bombay.
- *16. Tata Oil Mills, Ltd., Bruce St., Fort, Bombay.
- *17. Universal Trading Co., 79, Princess St., Bombay 2.
18. Uppal & Co., Roshanara Rd., Sabzimundi, Delhi.

Officials.

- *1. D. G. I. & S., New Delhi.
- *2. Deputy Development Officer (Electricals), D. G. I. & S., New Delhi.
- *3. Director, Indian Lac Research Institute, Ranchi.

APPENDIX II

[Vide paragraph 3(c)].

Statement showing the dates of visit to factories by the President, Members, Secretary and other Officers of the Board.

Serial No.	Name and location of the factory.	Date of visit.	By whom visited.
1	Indian Plastics Ltd., Bombay ..	6th April, 1949	President, Dr. Naidu, Mr. Rahman and Secretary.
2	Hindustan Plastics, Goregaon, Bombay	6th May, 1949	Do.
3	Tipco, Bombay	17th May, 1949	Do.
4	Right Brothers Ltd., Bombay	25th May, 1949	Do. and Asstt. Secretary.
5	Dominion Plastics Ltd., Bombay	17th June, 1949	Do. President Secretary and Mr. S. S. Mehta.
6	Tipco, Bombay	4th April, 1949	Mr. S. S. Mehta and Mr. S. V. Rajan.
7	Indian Plastics Ltd., Bombay	8th April, 1949	Do.
8	Hindustan Plastics Ltd., Bombay	18th April, 1949	Do.
9	Dominion Plastics Ltd., Bombay	21st April, 1949	Do.
10	Bright Brothers Ltd., Bombay	28th April, 1949	Do.
11	Government Electric Factory, Bangalore	2nd May, 1949	Do.
12	Plastic Products Ltd., Kanpur	18th May, 1949	Do.
13	Plastic Moulders Ltd. Calcutta	25th May, 1949	Do.

APPENDIX III

[Vide paragraph 3(c)].

*List of persons who attended the public inquiry on 14th and 15th June 1949
and who were examined by the Board.*

PRODUCERS

1. Mr. B. D. Garware	}	Representing	Dominion Plastics Industries, Chowpatty Chambers, Sandhurst Bridge, Bombay—7
2. " S. Viswanath			
3. " G. R. Bhide ..			
4. " R. K. Chinchlikar			
5. " T. W. Bhojwani		"	Bright Brothers Ltd., 156-A Tardeo Road, Bombay—7.
6. " C. P. Harry ..	..	"	The Electrical & Allied Industries (Travancore) Ltd., Electric House, Cantt. Travandrum.
7. " J. V. Rula ..	..	"	Hindustan Plastics Ltd., Podar Chambers, 109-Parsi Bazar, Fort, Bombay.
8. " R. D. Vidyarthi ..	..	"	Indian Electric Manufacturers' Association, 23-B Netaji Subhas Road, Calcutta.
9. " Raj Narain ..	..	"	Indian Plastics Ltd., Imperial Bank Avenue Bank Street, Fort, Bombay.
10. " S. P. Khosla	}	..	Kay Engineering Co., Ltd., Kapurthala.
11. " A. R. Khosla			
12. " Nariandas			
13. " M. K. Ramohandani ..	..	"	The Plastic Products Ltd., Kamala Tower, P. O. Box, 25 Kanpur.
14. " S. R. Poddar ..	..	"	The Plastic & Industrial Corpn. Ltd., Amar Building, Sir P. M. Road, Bombay.
15. " P. H. Sidhwa &	}	..	Swadeshi Industries Ltd., 33, Netaji Subhas Road, Calcutta.
16. " B. M. Thakkar			
17. " G. Zuelchaur			
18. " G. L. Ghia ..	..	"	The Industrial Plastics Coprn. Ltd., 20, Appollo St., Fort, Bombay.
19. " G. Khemani ..	..	"	Universal Plastic Products, 11, Worli Road, Bombay 1.
20. " A. B. Nicholson ..	..	"	Rubako Industries, Behramji Mansion, Sir P. M. Road, Bombay.
21. " N. D. Italia ..	..	"	National Moulding Co., Ltd., 20 Upper Chitpur Road, Calcutta.
			Plastic Metal, Lalgir Mansion, Harvey Road, Bombay.
			Star Bakelite Mfg. Co., Dhobi Talao, Bombay.

IMPORTERS

1. Mr. M. C. Modi	}	..	Electric Merchants Association, 35, Bhangwadi, Kalba Devi, Bombay.
2. " J. B. Shah ..			
3. " S. D. Sharma			
4. " K. N. Bengali			
5. " J. Fernandes ..			
6. " D. K. Sohini	}	..	Bakelite (India) Ltd., United Life Bldg., Sir P. M. Road, Bombay.
7. " A. Keown ..			
8. " T. Frandson ..	..	"	Imperial Chemical Industries (India) Ltd., Dongall Road., Ballard Estate, Bombay.
9. " T. H. Kataria ..	..	"	Larsen & Toubro Ltd., J. K. Building, Ballard Estate, Bombay.
10. " H. C. Nijavan ..	..	"	Takandas H. Kataria, 172-Hornby Road, Fort, Bombay.
11. " P. C. Mehra ..	..	"	Combined Services, 4, C, Connaught Place, New Delhi.
			Delhi Optical Co., Delhi.

APPENDIX III—~~contd.~~

CONSUMERS

- | | | | |
|-----------------------|----|--------------|---|
| 1. Mr. A. Gupta .. | .. | Representing | Chemical Industrial and Pharmaceutical Laboratories Ltd., Belasis Road, Bombay. |
| 2. „ W. I. George.. } | .. | „ | Cormpton Parkinson (Works) Ltd., Haines |
| 3. „ V. V. Dhume } | .. | „ | Road, Bombay. |
| 4. „ Champaklal .. | .. | „ | Manubhai & Co., 94 Vithalwadi, Kalba Devi Road, Bombay. |

OFFICIALS

- | | | | |
|-------------------------|----|---|--|
| 1. Mr. N. Srinivasan .. | .. | „ | Directorate General of Industries and Supplies, New Delhi. |
| 2. „ K. Narasimhan .. | .. | „ | Collector of Customs, Bombay. |

OTHERS.

- | | | | |
|-------------------------|----|---|----------------------------|
| 1. Mr. D. M. Trivedi .. | .. | „ | Kesar Sugar Works, Bombay. |
|-------------------------|----|---|----------------------------|



APPENDIX IV

(Vide paragraph 19).

Statement showing the rated capacity and actual production of Plasticware by firms which replied to the Board's questionnaire

Serial No.	Name of the factory	Rated capacity	1946-47		1947-48		1948-49	
			4	5	6	7	8	9
			Plastic goods	Electrical Accessories	Plastic goods	Electrical Accessories	Plastic goods	Electrical Accessories
ACTUAL PRODUCTION								
1	2	3	4	5	6	7	8	9
1	Plastic & Industrial Corpn. Bombay.	30,000 gross	..	..	6,157 gross (1948)	..	5290 gross (1949)	..
2	Kay Engineering Company, Kapurthala.	14,750 gross	..	..	..	5400 gross (1-4-48 to 31-12-48).	..	..
3	Synthetic Moulders, Calcutta	11,100.5 gross	..	..	11,100.5 gross.	..	..	..
4	Bharat Plastic Ltd., Calcutta	3,616 gross	..	..	..	..	1,618 gross	..
5	Universal Plastic Products, Bombay.	15,000 gross (electrical accessories). 90,500 gross (plastic goods).	..	..	26,653 gross	531 gross	..	..
6	Pronto-lite, Bombay	50,000 lbs. (Plastic products).	..	..	..	..	20,000 lbs.	..
7	Hind Plastic Works, Ltd., Calcutta.	12,000 gross approximately.	..	..	..	..	4,500 gross (1948)	..
8	Indian plastics Ltd., Bombay	4,480 lbs. approximately.	746.6 lbs.	..	1,680 lbs.	..	2,240 lbs.	..

9	Rubaco Industries, Bombay ..	1,13,782 lbs.	..	60,000 lbs.	..	72,000 lbs. (1948).	..
10	Oriental Plastics Corporation, Bombay.	2,400 gross (electrical accessories). 18,900 gross (Plastic goods).	..	7,400 gross	100 gross	..	..
11	India Moulding Co., Calcutta ..	5,839 gross	372 gross	..	697 gross	..	158 gross
12	Plastics moulders Ltd., Calcutta	..	"	..	..	11,000 gross (1948).	..
13	Swadehi Industries Ltd., Calcutta	8,000 gross (1947-48)	4,358 gross	..	4778.4 gross	..	3251 gross
14	Plastic Products Ltd., Kanpur ..	..	3,928 gross	..	4,028 gross	..	..
15	Dominion Plastic Industries Bombay.	9,000 pairs per day, knitting needles. 3,000 pairs per day, penholders. 700 lbs. per day rods, Tubes, and Beltings (3 shifts).	..	..	..	2,000 pairs per day (penholders and Knitting needles) (1949).	230 lbs. per day (Rods Tubes and Beltings).
16	Mhatre Pen & Plastic Industries, Bombay.	..	363 gross	956 gross	..	2162 gross	..
17	Plastic Manufacturers, Calcutta	1,500 gross (electrical accessories).	..	..	..	..	200 gross (1949).



सत्यमेव जयते